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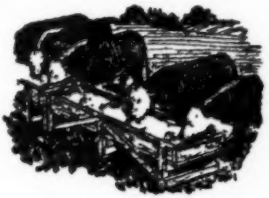
The **Farmer's Digest**

Volume 19 October, 1955 Number 4



FEEDER CATTLE

Prospects for Profit

Condensed from Michigan Farm Economics

H. M. Riley and R. C. Kramer

PRICES for feeder cattle and calves this fall will not differ greatly from those paid last year.

However, there is some reason to believe that prices will average slightly lower than the late fall prices of a year ago.

Due to drought conditions in the summer of 1954 there was a forced movement of grass cattle which met with a bearish demand. Feeder cattle prices reached a seasonal low in midsummer and then rose the remainder of the season. This was an abnormal seasonal pattern, since prices for stockers and feeders usually reach their low point sometime between September and November. Apparently the strong upturn in fat cattle prices and the large feed supplies in the major cattle feeding areas were the principal forces behind the rising feeder cattle prices.

This year a more normal seasonal movement of grass cattle is expected with peak volume during late September or October. Feeder buyers should watch market reports so as to take advantage of any temporary price weakness. The potential supply of stockers and feeders this fall will be about the same as a year ago.

Factors which point toward a weaker demand for feeder cattle as compared to last year—

(1) The expected large supply of slaughter cattle along with larger pork supplies will keep fed cattle prices slightly below 1954 price levels.

(2) The narrow margins realized by many cattle feeders this

Reprinted from Michigan Farm Economics, East Lansing, Michigan

past season will make them more cautious buyers.

Factors which will tend to stimulate demand for feeder cattle as compared to last year—

(1) Most important is that near record feed concentrate supplies are in prospect for the 1955-56 feeding season.

(2) Lower support prices on feed grains will also lend encouragement to cattle feeders.

(3) The severe drought which prevailed in the Central and Southern Great Plains for the past three years was broken during May and June. If improved range conditions extend into the fall, the demand for feeder cattle in these areas will be much stronger than last year.

Slaughter Cattle Prices

The demand for beef will be maintained at a high level during the remainder of 1955. Prospects are good that the record levels of employment and income will be extended at least through the first half of 1956. During the past year consumers' spendable income has risen five per cent.

Beef supplies for 1955 will total about the same as a year ago, when an all-time record of 79 pounds per person was marketed. Cattle slaughter in the first half of 1955 was two per cent larger than during the corresponding period a year earlier. Beef output during the last half of 1955 will probably continue slightly above a year ago, reflecting the

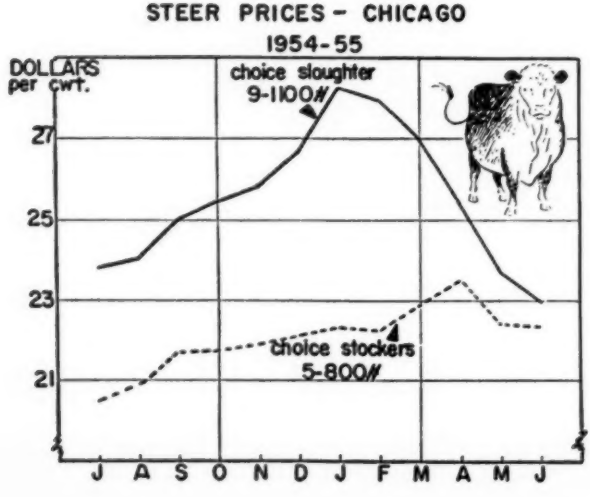


Fig. 1. Steer Prices, Chicago, July 1954 to June 1955—Prices for choice slaughter steers rose sharply last fall. Prices for choice stocker steers advanced during the fall marketing period after reaching a low in mid-summer. Margins were quite narrow on cattle bought in late fall and sold during the April-June period.

13 per cent larger number of cattle in feedlots on July 1. When the increase in population is taken into consideration the supply of beef per capita will be about equal to last year.

Although most consumers do not readily substitute pork for beef, expanding pork supplies will have a moderate depressing influence on beef prices during the next twelve months. According to a recent U. S. Department of Agriculture pig crop report, pork supplies through mid-1956 will average about 10 per cent larger than during the corresponding period a year earlier.

It is also significant to note that total red meat supplies per person are now running at the highest levels in over 40 years. It is estimated that the average person will consume 158 pounds of beef, veal, pork, lamb, and mutton this year (Wholesale carcass weight). This compares with 154 pounds last year and a 1944-53 average of 146 pounds.

Even though demand for meats will remain strong the larger supplies are expected to hold slaughter cattle prices below levels reached in late fall and early winter a year ago.

Feed Supplies

Mid-summer indications are that supplies of feed concentrates will be a near record this fall. The carryover of old crop corn is expected to be about one billion bushels. It seems probable that this year's corn crop will exceed three billion bushels. If this happens, the total corn supply will be the largest of record. Planted acreages of other feed grains are larger than a year ago as farmers have shifted some of their land from controlled crops to feed production.

Support prices for feed grains have been lowered on this year's crop.

	National Average Support Price	
	Last Year (54-55)	This Year (55-56)
Corn (bu.)	$1.62	$1.58
Oats (bu.)	.75	.61
Barley (bu.)	1.15	.94
Grain Sorghum	2.28	1.78

Corn prices are expected to be substantially below support levels at harvest time. It is believed that many farmers have overplanted their acreage allotments and consequently are ineligible for the loan or purchase agreement programs.

Range and Pasture Conditions

Pasture feed on farms June 1 was the poorest for this date in 16 years. Western range conditions on May 1 were the poorest in 33 years. Rains in late May and early June greatly improved hay and pasture conditions and broke the three year drouth that has prevailed in the Central and Southern Great Plains. This

stimulated late season demand for lightweight stocker cattle. If favorable moisture conditions continue through this fall more cattle will be wintered in these areas than a year ago. It is also possible that the late development of pasture may delay movement of cattle to market this fall.

The Cattle Cycle

The number of cattle and calves on farms showed another small increase this past year. Numbers have risen 24 per cent since the low in cattle cycle was recorded in 1949. Beef cow numbers have increased 52 per cent during this six-year period while milk cow numbers have remained relatively stable.

In the past 50 years cattle numbers have followed a cycle averaging about 6 or 7 years of increasing cattle population followed by a period of 6 to 7 years of decreasing numbers. Downturns in cattle numbers have usually been associated with short feed supplies, or the expectation of sharp price declines. Currently feed supplies seem adequate to maintain our cattle population of 95 million head. The government control programs have forced land out of wheat and cotton and into production of hay, pasture, and feed grains. At the same time demand for meat is being maintained by a high level of consumer purchasing power. Under these conditions only a severe drouth could cause a sharp liquidation of cattle numbers in the year ahead.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACTS OF CONGRESS OF AUG. 24, 1912, AND MARCH 3, 1933, AND JULY 2, 1946, of the Farmer's Digest, published 10 issues a year at Fort Atkinson, Wis., for October 1, 1955.

State of Wisconsin
County of Jefferson

SS

Before me, a Notary Public in and for the State and County aforesaid, personally appeared Hugh Highsmith, who being duly sworn according to law, deposes and says that he is the publisher of the Farmer's Digest and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, and July 2, 1946, embodied in section 537, Postal Laws and Regulations, to wit:

1. That the names and address of the publisher and digest editor are: Publisher, Hugh Highsmith, Fort Atkinson, Wis.; Editor, L. Bush-Brown, Ambler, Pa.

2. That the sole owner is Hugh Highsmith, Fort Atkinson, Wis.

3. That the known bondholders, mortgagees and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages or other securities are: none. Signed, Hugh Highsmith, Publisher.

Ormal E. Kiesling, Notary Public. (My commission expires September 18, 1955.)

Sworn to and subscribed before me this 1st day of September, 1955 (Seal).

Three Litters in 15 Months

Two brothers sold 314 pigs from eight sows in 15 months. They turn out a new litter every fifth month during the year . . .

Condensed from The Farmer

Robert G. Rupp

THAT'S a pretty good record —314 pigs sold from eight sows in 15 months; three litters per sow in 15 months, with 8 to 10 pigs-per-litter saved.

Even figuring from farrowing to farrowing with no time allowed for the beginning breeding period, that kind of production adds up to a pretty fair batting average.

It's a true average, though, and the record belongs to Althoff Brothers, two Richland County, N. D., wholesale pork producing farmers.

The Althoffs got those high returns in this way:

They started off with Hampshire sows mated to a Yorkshire boar. The sows came from their our herd two years ago, carefully selected from a drove of 15 on the basis of big litters, good disposition, and an ample supply of dinner plates for the coming broods.

At farrowing time four sows are quartered in a building 12 x 12 square—each sow given a six by six-foot pen by dividing the building down the middle with a 12-foot panel, then dividing each half by a six-foot panel. During cold months a corner pig brooder is added in each sow's stall.

A week to 10 days after pigs arrive the two six-foot cross panels are taken out, leaving two sows and two litters in each half of the building. At the same time, two brooders are taken out and the remaining two shifted to the rear of the house. A creep panel, which allows pigs in but not sows, is also put across the back of the house.

Small feeders are put into the creep for the pigs. Pelleted pig-starter mixed with clean black dirt is placed in the feeders. "Pigs like dirt. They like to nose around in it," points out Harold Althoff. "Pretty soon they discover the pellets and begin to eat as well as nurse the sow."

The Althoff's use no iron com-

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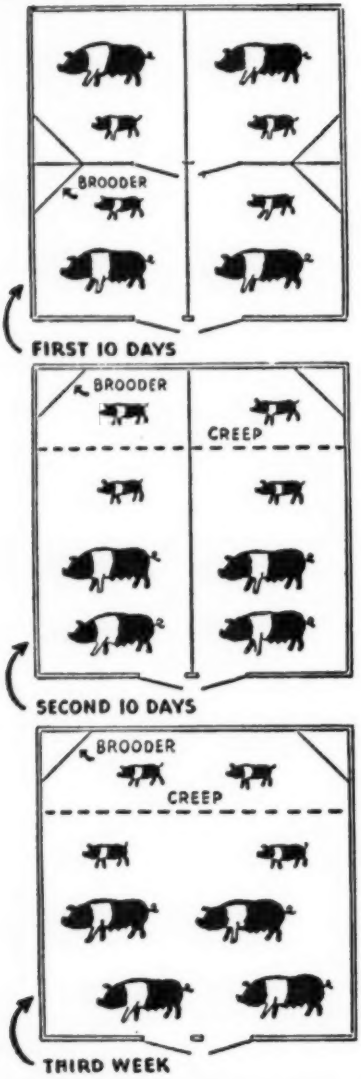
Four Sows in a 12′ x 12′ Building



Sows and Breeders Are Removed in Fourth Week

pound to prevent anemia—just clean black dirt spaded from a field some distance from the hog pasture each fall before freeze-up.

Within two to three weeks pigs and sows have become crowded in their quarters, so out goes the middle, 12-foot panel. Pigs are still nursing, but are eating more pellets by this time. Sows are turned outside for feed and water.

At four weeks, pigs are weaned and sows are taken out of the pens. Brooders are also taken out, if the weather isn't too cold.

The pigs, now used to solid feed, make the shift from sows to pellets with no set-back. "We tried weaning at three weeks, but pigs are too little then. They won't look for food—just want to sleep. We had to stir them up every few hours to get them to eat," says Harold.

"By waiting until four weeks to wean, pigs are ready to take over the troughs outside. As soon as they have made that shift, the small creep feeders are removed."

Once their pigs are weaned, sows are re-bred, usually within a few days to a week. That sets the Althoffs pig production time schedule at five weeks from farrowing to breeding. It puts production on a five-month cycle from farrowing to farrowing. Some of the current crop of sows, that produced the 314 market hogs in 15 months, have far-

rowed seven times on that cycle. The rest have farrowed five times. They have all averaged eight to ten pigs-per-litter sold.

The two 12-foot by 12-foot houses are pulled closer together (or may have been so spaced at the beginning) at this point and all pigs run together in one pen from the time they are four or five weeks old.

> At 18 months a Holstein heifer should weigh about 860 pounds, a Guernsey 660 pounds, a Jersey 615 and an Ayrshire 690.

The Althoffs fatten out their pigs; sell none as weanlings. The portable houses are moved to clean ground between litters and the pigs put on pasture during grazing months.

"One advantage of a house as small as ours is that we don't need much heat to keep it warm. It's not like a big, permanent house," points out Harold. Their only source of artificial heat is 100-watt electric light bulbs (not heat bulbs) in the brooders. The 100-watt bulbs are reduced to 50-watt size as the pigs grow. The Althoffs use "rough service" bulbs—regular light bulbs now on the market, built for rough treatment. They are identified with the words "rough service" on the end. Rough service bulbs cost more, but they last longer.

"We're a little crowded in our houses," admits Harold. One time we had three sows and 32 pigs in the 6 by 12-foot half of one house—but our set-up is economical."

It's profitable and efficient.

Artificial Breeding Aids Disease Prevention

Artificial breeding of dairy cattle has many advantages—among them prevention of genital diseases, says Dr. S. L. Kalison, Virginia veterinarian.

Of this group of diseases, trichomoniasis and vibriosis are spread primarily by natural service. Adding antibiotics to semen, particularly streptomycin, makes it incapable of spreading vibriosis. The technique of insemination reduces the possibility of spreading trichomoniasis to a minimum.

Breeding the entire dairy herd artificially with semen from bulls free of trichomoniasis to which antibiotics have been added eliminates these two diseases as possible causes of reproductive failures. Semen that meets these requirements is available to dairymen in most areas, Dr. Kalison points out.

Buy Used Machinery At Reasonable Rates

A farmer with a good eye for machinery can get enough field equipment to start operating a 120 acre dairy farm for less than $4,000.

That's not easy when new two-plow tractors cost $2,000 or more. The secret is good second-hand equipment, says Orrin Berge, University of Wisconsin farm engineer.

But don't pick up a lot of junk. Be a little choosey, and you can find plenty of second-hand machinery in good shape on lots and at auction sales.

Based on equipment prices at one large machinery lot in southern Wisconsin, here's one way Berge says a farmer can get a complete line of machinery at minimum cost.

1. Shop around a little and you'll be able to get a good two-plow tractor with cultivator, maybe three or four years old, for $900.

2. There are plenty of good used plows and discs on the market, but you'll need a new spiketooth "drag" harrow. Figure $100 for a plow, $150 for a disc, and $80 for a new three-section drag.

3. Good used grain drills are hard to find, so plan to spend about $500 for a new one. A separate lime and fertilizer spreader will cost $100 on the used machinery lot.

4. Find a pull-type or converted horse-drawn corn planter. A good one will cost about $75.

5. You'll need a good hay mower. That'll cost around $150. Then a used side rake for $150, a $135 wagon, and a hay loader at $50 will round out your basic haying equipment needs.

6. Don't skimp on the manure spreader. A new one will cost $425.

Add it up, and the machinery listed here will cost $2,815. Berge says a farmer starting out his business might figure on having custom operators do the baling, chopping, combining and corn picking. But with the prices as listed, you can pay another $850 for a good used baler, and you still have less than $4,000 invested in machinery.

For a farmer wanting extra tractor power for belt work, cultivating, and other jobs, Berge says there are many older two-plow tractors available for $400, or even less for tractors without starter and lights.

Wisconsin Extension

FROZEN SEMEN

This new development in artificial insemination may bring the service of any sire within reach of all dairymen . . .

Condensed from The Ohio Farmer

NOT too many years ago, only the exceptional cattleman could afford an outstanding breeding bull. Artificial breeding has now made good sires available to everyone — without regard to the size of the herd.

But, artificial breeding did have its limitations. Good bulls were available, but the herd owner didn't have a wide choice of sires on a particular day. This was because liquid semen is a perishable product and must be used within a few days after collection.

How to keep the sperm cells alive and useful for days or even months was the problem. Accomplish this and you could use almost any bull for any given mating. Also, greater use could be made of outstanding bulls.

Now researchers and artificial breeding technicians seem to have the answer to this one. Freeze the semen at 110 degrees below zero and it may be stored for an indefinite period.

Ohio's artificial breeding associations are already making use of this idea. Technicians of the Central Ohio Breeding Association have inseminated more than 22,000 cows with frozen semen. Richard Kellogg, association manager, terms it "the greatest shot in the arm to the breeding of dairy cattle since the association was started back in 1946."

Use of frozen semen is also being developed in the Northern Ohio Breeders Association. Manager Max Drake reports that some 800 cows were bred during the spring of 1954 in a carefully planned project to study the use of frozen semen. These cows were bred by 13 different technicians from the service of about a dozen different Holstein bulls. On the basis of this first experiment, the conception rate was equal to that obtained with liquid semen.

During the past fall and winter, however, the conception rate with frozen semen was less than with the liquid product. Much work goes into the development of any new idea and this is true of frozen semen.

Manager Drake reports that they have tested many methods of handling and storing the frozen product. "At the present

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time," he says, "the semen which we have been freezing looks far superior upon thawing, to any that we have used in the past. We are quite confident that newer techniques of freezing are giving us better results and only time will answer the question."

Drake is confident that frozen semen will prove a real boon for cattlemen, just as soon as all the technicians problems are licked. He says: "We look forward to the time when practically any bull in America can be available to any farmer who wants to use him".

The Central Ohio Breeding Association started to use frozen semen on a trial basis in September of 1953. Dean Shoemaker, technician in Franklin County, was the first to start using the new product. He was within easy reach of the bull farm where Manager Kellogg and his coworkers could keep close check on his progress and assist in his pioneer work. Results were gratifying! Five months later Shoemaker began using frozen semen 100 per cent in his breeding work.

Four months later, 11 additional COBA technicians started using frozen semen entirely. By December of last year 21 technicians were entirely on frozen semen and breeding about 30 per cent of all the association's first services to dairy and beef cattle.

Since frozen semen can be preserved for long periods, a breeder can tell his technician the number of cows he wants to breed in the next month. His technician can then reserve the semen from a particular bull.

This pays off in many ways. Some of these "princes of the breed" are known for their ability to sire offspring that have extra good feet and legs. Others are known for siring offspring that have strong, well attached udders. Some combine all the desirable characteristics.

Frozen semen makes it possible for the breeder and his technician to select the bull that they feel will do the best job on any cow in improving her offspring. The breeder can study his catalog of sires furnished yearly by his association and plan in advance the breeding program he desires.

If the breeder asks for no particular bull, some technicians are making it a point to study the cow's physical make-up and then use the bull they think will do the best job in improving type.

The conversion process from liquid to frozen semen has been a slow one for the Central Ohio Breeding Association. One of the necessities in storing frozen semen is the maintaining of proper temperatures. This has required much work in studying the type of field kit needed by technicians to carry frozen semen to member herds.

Early users of frozen semen carried their supply in a canvas-covered chest. Inside, low temperatures were maintained with dry ice. However, this storage chest did not prove satisfactory. It used too much dry ice. COBA has since converted to a metal-covered chest.

At least 15 or 20 different types of storage boxes have been tried by the Northern Ohio Breeders Association. One type now being tried will store 600 vials of semen, hold about 150 pounds of dry ice and operate in a home freezer set at 10 degrees below zero.

With liquid semen some 85 per cent is lost two or three days after collection because of aging. Frozen semen permits the use of 90 per cent with only about 10 per cent discarded. This 10 per cent includes sampling for examination and testing, losses in transportation, failure to live in storage, glass breakage, etc.

More cows can be bred to outstanding bulls because of frozen semen. Their influence can also be carried on long after their death.

Frozen semen seems to be the answer to a purebred breeder's prayers. Until frozen semen appeared, some had used artificial breeding only on a limited scale. This was because they wanted to follow certain bloodlines and there were only a few bulls available on any one day.

Shipments of frozen semen for special matings have been made from COBA to 31 states. On February 15 of this year a shipment was made to Copenhagen, Denmark. This is thought to be the first time frozen semen has been sent to a foreign country from the United States.

Twenty ampules of semen from a Jersey sire, Signal Commander, were packed in dry ice and put on a Trans World Airlines transport at Port Columbus. The frozen semen arrived in Copenhagen just 60 hours after leaving Columbus.

Strike Blow Against Erysipelas

The American Foundation for Animal Health reports that swine erysipelas may be dealt a staggering blow in the near future by a one-two punch now being tested by the veterinary medical profession. This involves a two-fold vaccination program involving gilts and their offspring. Vaccinating gilts before breeding is said to give baby pigs immunity for as long as six weeks. Vaccination at weaning age then continues the production for a substantial percentage until market age.

Better Farming Methods

Why Fall Freshening Pays

Cows that freshen in the fall offer increased profits for dairy herd owners.

A Purdue University extension dairyman, G. A. Williams, says seasonal variations in milk production are receiving more and more consideration. Fall freshening of cows is a definite advantage for dairymen who produce high quality milk for fluid use.

About 50 per cent of a cow's total milk flow each year comes during the first four months after she freshens. If this period occurs during fall and early winter, hot weather, flies and poor pastures do not tend to reduce the daily flow of milk.

Price levels also are in favor of fall freshening. Although feed costs are somewhat higher in winter than summer, better milk prices offset those costs.

High producing cows, especially first-calf heifers, should be milked three times daily for the first 60 to 120 days after calving, states Williams. Lack of time often does not permit an extra milking during the spring and summer months.

More favorable conditions exist for getting young calves off to a good start in the fall. If calves are born in the fall they are ready to utilize grass when the spring grazing season begins.

Milk-feed rations released by the Bureau of Agricultural Economics show that 100 pounds of milk produced during October, November and December for the last five years had a purchasing power equal to 135 pounds of concentrates. The ratio for the same years was only 112 pounds for April, May and June and 124 pounds for July, August and September.

Increased production, high market values and lower feed costs should induce dairymen to give serious consideration for having at least 50 per cent of their herds freshened between August 1 and December 31.

Purdue University

How would you like to retire with $108.50 a month—with an additional $54.30 for your wife when she's 65? If your wages or self-employment net earnings are $4200 a year from now until you're 65—that's what you can probably count on. If you're already near or past 65, you will need to have earnings of this amount in 1955 and at least the first half of 1956 to qualify for this maximum Social Security benefit.

What Causes Poor Quality Silage?

Research scientists in Wisconsin have tested hundreds of samples of silage to find an answer to the question of quality . . .

Condensed from The Country Guide

MOST farmers can tell good silage from poor silage. When it comes to telling just why one lot of silage was poor and another was good they are not quite so sure.

A group of scientists at the Agriculture Experiment Station, University of Wisconsin, last year undertook to throw additional light on the problem. They put up 450 samples of pure alfalfa silage in quart jars and studied fermentation and its affect on silage quality. Through the year they tested the samples to determine how good silage differed from poor, in terms of chemical and bacterial content. Reactions of silage in glass jars is much the same as in large silos.

They found good quality silage contained large amounts of lactic acid and smaller amounts of acetic and succinic acid. In good silage there were no propionic or butyric acids.

Poor quality silage contained little or no lactic acid and larger proportions of propionic and butyric acids, as well as some acetic and succinic acids. The succinic acid gradually disappeared in the later months of storage.

The scientists are fairly well satisfied that poor quality silage contains organisms which use up the lactic and succinic acids. It was established that acceptable silage was more acidic than poor silage.

> Fertilizer has gone up about 30 per cent since the war. Machinery, building materials, and fencing have risen about 80 per cent.

What does this mean in practical farm terms? Silage quality depends a lot on the moisture in the alfalfa. Silage stored at 75 to 100 degrees F. made very good silage when the moisture content ranged between 67 and 69 per cent, while samples with 73 to 83 per cent moisture made poor silage at these temperatures.

All samples stored in this tem-

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290 Vaughan St., Winnipeg, Manitoba, Canada

perature range contained plenty of bacteria, but the quality of the silage depended on the moisture content. Fermentation was good up to 115 degrees F., but only low-moisture silage was of good quality.

Silage made with molasses preservative was of excellent quality, even if the moisture content was high. Other good preservatives were 0.4 per cent sodium metabisulfite, 0.375 per cent Kylage or one per cent calcium formate. These preservatives improved acid production and prevented the formation of undesirable butyric acid in the silage.

Good quality grass silage was made w i t h o u t preservatives, when put up at the proper moisture content. Where preservatives are needed ground corn has done a good job.

The bacteriologists tried making silage as late as September and October. These late samples always graded low, even though there was a good build-up of bacteria. The bacteria produced very little lactic acid but large amounts of butyric acid. The scientists think that the late-cut alfalfa did not contain enough fermentable carbohydrates for good acid production. On the other hand, alfalfa cut in late bloom, but early in the season, fermented just as well as that cut in the early bloom.

In practical terms the experimental work confirms that grass crops should be put up with a moderately low moisture for silage, or else a preservative should be used. In scientific terms the work has revealed valuable information on the chemical and bacteriological processes that take place inside the silo.

Plastic Liner Helps Boost Apple Storage

A new plastic crate liner now under test may help put crisp apples on the store shelf past late winter.

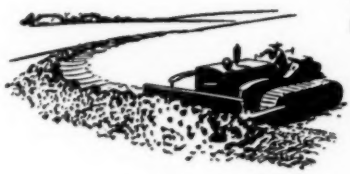
The liners are similar to the transparent plastic bags you see around fruits and vegetables at the grocery store. Michigan State horticulturists have the bags under test. They believe the bags may keep the apples in good, crisp condition past March 1.

They say growers, wholesalers and retailers are well pleased with the new plastic liners, particularly for storing the Golden Delicious apple. They want to be sure, however, that the bag helps keep other varieties from wilting and shriveling, too.

For the best results, the scientists say, the bags should not be sealed, merely folded.

Michigan State College

Terraces Are a Nuisance, But Mighty Profitable



Well-built terraces will help you grow more high-income crops on your farm

Condensed from Missouri Ruralist

Cordell Tindall

TERRACES are a nuisance. That's the general view of just about everybody who farms them. But they're necessary to hold down soil erosion on rolling land that is being farmed for top production.

Terraces have a tremendous effect on long-time management of land. Use of terraces permits more intensive cropping. More pointedly, you can grow more "high income" crops.

To confirm these statements, just talk with farmers who have a complete system of water management in operation, including terraces. To learn exactly how terrace systems do affect farm management plans we visited several farms in Lafayette county, Mo., all of which have had Balanced Farming plans in operation several years. These owners have had time to see the effects of their programs.

When a field is first terraced it's quite a "shock" to it, particularly if the slope is fairly steep. Bare subsoil may be exposed in spots, backs of some terraces may be pretty steep. But thru use of commercial fertilizer and year-to-year maintenance the field soon takes on a new stability. The rough spots are leveled out—literally!

Terracing also is somewhat of a shock to the farm operator, it seems. But this soon wears off, too, and owners learn to "live with" terraces.

Erich Oetting, Concordia, expresses himself by saying, "I like to farm with terraces because I know I'm doing the right job. I'm keeping the soil, fertility and moisture."

This feeling of self-satisfaction comes with soil conservation. Most of us feel it is our duty to conserve and improve the soil. The desire to hand on a piece of land in better fertility than we found it is a common one.

But there's more to soil conservation than this. Most of us must make a living at the same time we're conserving the soil. And here is where a good set of ter-

Reprinted by permission from Missouri Ruralist, Kansas City, Missouri

races, with waterways, of course, make their great contribution. They allow us to work the soil hard.

There's just one catch to increasing acreages of high income crops on terraced land—government acreage allotments. Edwin Kempfe, Alma, has had an experience that is somewhat typical. Several years ago he completely "remodeled" his farm. While this was going on, corn acreages were cut down until the water management plan could get into full operation.

Now the farm is ready to go! The plan is almost complete and is working fine. But because of a small corn base Kempfe is being limited to less acreage of corn than efficient management would call for.

Despite this, Mr. Kempfe is highly pleased with his water management plan. A torrential rain this spring clearly demonstrated its worth. Some washing occurred between terraces but erosion was very little, indeed, as compared to fields that were not terraced in the same area.

Alfalfa Holds Soil In Place

Once established, alfalfa does a good job of holding soil in place. Seeding time is critical, tho. One big rain on the finely prepared seedbed really can be costly. Here, again, terraces are the answer.

Arlie E. Pemberton, Lexington, has used alfalfa to boost livestock production on his farm. He not only uses alfalfa for hay. but alfalfa and brome grass permanent pastures.

Mr. Pemberton has a relatively small farm—145 acres. But it is geared for high production. A short rotation of corn - small grain - red or sweet clover is the basic rotation on the farm. Trouble with sweet clover weevil has just about brought a complete switch to red clover. Usual amount of corn is 35 to 40 acres.

Hogs have been important in the farm management here—the usual number of sows is 15 but as many as 30 have been farrowed.

> The difference between a farmer and a gentleman farmer is that the latter is spared the harrowing details.

Most progress has been made in building up the beef herd of purebred Polled Herefords. The size of the herd has just about been doubled, from 25 cows to 50 head of adult animals. Steer calves are fed out—another management practice that increases the income from beef herds.

It's obvious this is a "hard-working" and productive farm —there's little waste land. The water management plan plays a key role in this production. And by "farming on the level" Mr.

Pemberton thinks the terraces save enough in fuel consumption to balance the inconveniences of point rows and crossing terraces.

Still another Lafayette county farm, that's completely terraced is that of W. S. Browning, Odessa. Mr. Browning has reached the time of life where he would like to "ease up" a bit. Here again, the water management plan plays an important role. He has gone to a system of grass farming but it has been improved grass—there's no bluegrass on the entire 160-acre farm. Here on this farm the terracing cost $30 an acre, but obviously the worth of the land has been greatly increased. Drouth has hurt the stands of grass but there has been little erosion.

Yes, terraces are a nuisance. But they permit a more flexible farm management plan. Rotations can be carried out as planned. Any field can be plowed or cultivated at any time. They are the mark of a hard working farm.

New Insecticide to Give 100% Kill on Cattle Grubs

Within another year or two farmers can expect to be controlling cattle grubs with a new insecticide that gives 100% grub kill. That's the prospect, at least, for a new phosphate-type insecticide developed by entomologists at the USDA research laboratory at Corvallis, Ore.

Called 21/199 for simplicity, since its long chemical name is a real jawbreaker, the new compound has been found effective when used either as a spray or as a wash. In tests at the lab, a spray, of one part of the chemical mixed with 200 parts of water and applied to the backs of grubby cattle, killed all of the grubs in less than a week.

This insecticide apparently kills the grubs by direct contact, says Dr. G. W. Eddy, one of the entomologists in charge of the tests. As grubs reach a late stage of development within the cattle, they form cysts under the skin of the back. Trace amounts of 21/199, used either as a spray or wash, penetrate these holes and reach the grubs, killing them, Eddy explains.

Two other phosphate-type insecticides tested by the Corvallis scientists give 100% grub kill. But they are effective when used only as a back wash.

Will this new grub killer be released soon for farmers to use? Yes, provided that no adverse effects turn up, Dr. Eddy cautions. So far, no toxic effects have been noted either in the meat or milk from treated animals.

U.S.D.A.

Calf Scoring System Helps Dairymen Pick Better Replacements

Dairymen may soon be able to choose potentially high-producing replacement cows for their herds by observing mammary-gland development in young calves and grading the animals accordingly, U. S. Department of Agriculture scientists report.

In 25 years of tests, dairy husbandmen of USDA's Agricultural Research Service have developed a mammary-gland scoring system that enables them to rate the milk production potential of 4 and 5-month-old calves in their high-producing Jersey and Holstein herds at Beltsville, Md. The system is now under test on 40 herds in 15 States that are cooperating with USDA in this dairy research. Test results will indicate whether the system is practical when applied to calves of various breeds and inheritance, raised under a variety of environmental conditions. So far, more than 7,500 heifers have been scored.

Results of testing this scoring system on the experimental dairy herds at Beltsville are contained in USDA's Technical Bulletin No. 1111, "Evaluation of Mammary Gland Development in Holstein and Jersey Calves as a Measure of Potential Producing Capacity," just issued. Single copies are available free on request from the Office of Information, U. S. Department of Agriculture, Washington 25, D. C.

Research dairy husbandmen have based their rating or scoring system on three criteria: (1) age of calf; (2) size of the mammary glands — i.e., length and width; and (3) stage of development of the glands—their shape and form. These measurements are translated into a score, ranging from 1 to 9, from the least to the most developed. A score of 5 is standard or average. The best time for scoring is before the calves reach six months of age.

Jersey calves, tested at four months and graded 7, 8, or 9, produced 2,460 more pounds of milk and 143 more pounds of butterfat during their first year of milking than did the cows that, as calves, rated 1, 2, or 3 in mammary-gland development. With Holsteins, rated at five months of age, the difference was even greater—4,358 pounds more milk and 164 pounds more butterfat were produced by cows that made high scores as calves. The production figures are based on three milkings daily for 365 days and adjusted to a mature-age basis.

How About The Economy of Milk Replacers?

Here are some interesting facts and figures concerning the economy of milk replacers for dairy calves . . .

Condensed from Holstein-Friesian World

Professor N. N. Allen, University of Wisconsin

SHOULD a dairy farmer use a milk replacement feed in raising calves?

The farm papers he reads are full of advertising telling him that he should. His common sense tells him that the claims made by some over-enthusiastic manufacturers sound fantastic. Have vitamins, minerals and antibiotics teamed up to make a food for young calves that is four or five times as good, pound for pound of dry food nutrients, as milk, which has long been regarded as the most nearly perfect food product known.

Dairy farming is a business, so why not sit down and think it through in a sound, business-like way?

Why Use a Replacer?

There are three reasons why we might want to use a replacer: 1. To give the calves better nutrition than we can get with milk. This would result in more rapid growth and fewer calf losses. 2. To save time and work in feeding. 3. To lower feed cost.

First, let's think these points through, one by one.

a. Will replacers give better results than milk?

It would be embarrassing for a dairyman to answer "yes" to this question. If there are better foods than milk for calves, they should also be better for babies, for growing children, for athletes, for pregnant or nursing mothers or for the many other situations where milk is recommended by doctors and nutritionists. Why do our school children have their glass of milk as the only food specifically required in the school lunch? If milk is recommended for humans where we want the best of results, regardless of cost, we can be very certain that there is no better

Reprinted by permission from Holstein-Friesian World, Laconia, New York

food known. Milk is still the foundation of the diet of our human babies and it's still the best we know for baby calves.

What About Vitamins?

By adding large amounts of vitamin A, it is possible to raise calves on skim-milk right from the time they are taken from the cow. But the vitamin A doesn't make it *better* than whole milk. It doesn't even make the results as good. It makes it *possible* to do something that could not be done on skim-milk alone as a substitute for whole milk. Any milk replacer must have vitamin A added or many of the calves won't live. Whole milk *has* the vitamin A, and calves thrive on it.

Most replacers have minerals added. When grain products are substituted for milk solids, minerals *must* be added if the calf is to get the needed minerals. Milk *has* them, so we can hardly expect improvement as far as minerals are concerned. And we certainly aren't going to improve on milk for quality or digestibility of protein.

Will the antibiotics which most milk replacers carry make substitutes better than milk nutrients? Feeding a very small amount of some of the antibiotics has improved the results with young calves in most experiments. This was especially true in cases where calf scours was causing trouble. Scouring has been one of the difficulties in the past when gruel feeds were substituted for milk in very young calves. The antibiotics are especially helpful in making satisfactory results possible with gruel feeding. They can also be added to the diet of milk fed calves at little cost, and many of the calf starters fed with milk contain them.

Where Does This Leave Us?

By using vitamins and antibiotics, it is now possible to produce milk replacement feeds which give reasonably satisfactory results when fed to calves in place of all the salable milk ordinarily used. This does not mean, however, that these calves will fully equal whole milk calves in growth or livability, but the results with a good replacer are acceptable. This brings us to the second question:

b. Will milk replacers save time and work?

Milk is usually fed to calves immediately after milking, while still warm. It would be hard to find a simpler, easier way of feeding. It will be more work, not less, to measure out a dry feed, add a measured amount of warm water and stir until well mixed. So most dairymen will agree that they don't expect better results by using replacers, or that they will save work. This leaves it purely a matter of cost.

c. Will milk replacers save

money?

Milk is the principal product sold on the dairy farm. Any milk fed means a smaller milk check. That has been the reason for skimping more and more on milk fed. But there's no economy if we spend five dollars for milk replacement feed to save four dollars' worth of milk. How can we figure the costs so we will know whether we are really making a saving?

First, let's see what is in 100 pounds of milk. Morrison's "Feeds and Feeding" lists whole milk as supplying 3.3 per cent of digestible protein and 16.3 per cent of total digestible nutrients. A good low-fibre dry feed will have about 80 per cent of total digestible nutrients. It will take about 20 pounds of a dry feed such as the average milk replacer to equal 100 pounds of whole milk in energy value, and it must have about 16 per cent digestible protein (20 per cent or more of total protein) to equal the milk in protein. This means that if a milk replacer sells at 20 cents per pound, we would not save any money unless milk sells for $4 per hundred or more, even if we assume that the replacer is fully equal to milk in results. We certainly can't save enough to pay for our trouble unless we can buy a 25-pound bag of replacer for the net farm price received for 100 pounds of milk.

Won't it hurt our market if we use substitutes for milk in raising calves? Is this the same as using oleo on our tables? It certainly won't help milk prices during a surplus milk period if we put on the market the milk which has been used for raising calves. Possibly it's not quite like using oleo on the table, for the milk replacers usually contain at least one-third milk products such as dried skimmilk or dried whey, and some of them are made up almost entirely of such milk products. The fact that most manufacturers feature the milk products in their advertising indicates that they recognize them as the best part of their feed. But in the long run, we *will* help our own market by using milk for calf feeding.

Are we skimping too much on milk for calves? A dollar's worth of milk saved means an extra dollar on the milk check. But a good farmer will be glad to invest that dollar if he can see a chance to get two dollars back a couple of years from now. Suppose we feed an extra hundred pounds of milk to each of our heifer calves, and get better growth as a result. If because of this extra growth we can freshen these heifers on the average a week younger, the profit on this extra week will easily pay back the cost of the extra milk fed. And the bigger, growth-

ier heifer goes right on paying extra dividends on the better feeding as a calf. Research has shown that better fed heifers come into heat and may be bred at a younger age than poorly fed, stunted ones.

Should Milk Plants Promote Replacers?

The milk plant would probably like to get a bigger volume of milk, so it might look like good business to encourage use of milk replacers. But the plant man, like the farmer, must not be short-sighted in his thrift. He likewise should be glad to sacrifice a hundred pounds of milk today if it will mean two hundred pounds in the future.

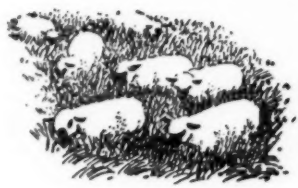
Both the plant man and the producer have another very important stake in well-grown-out heifers. The milk plant needs more of its milk during the winter months. The producer would like to have more to sell then, because prices are better, and he has more time to take care of his cows. For that reason, fall freshening is desired. Suppose we start with all of our cows freshening in the fall. The heifer calves born then will be the milking cows of the herd in a few years. The October-born heifer can be an October freshening cow only if she is bred and settled at 15 months of age. If we wait until 18 months, she comes in in January, or if we wait until 21 months, she freshens in April.

To keep a fall-fresh herd, the producer must start breeding his heifers at about 14 months. It can be done with thrifty, well-grown heifers, but it won't work if they are stunted or undersized. A little extra milk to the calf can be a big help, and it will return good dividends to the producer and the processor.

Without milk, it would be difficult, if not impossible, to eat enough other food in a day's time to supply all the calcium the body needs. You need calcium all your life—not just while teeth and bones are being built. Three glasses of milk each day will supply the calcium a normal adult needs.

The dairyman should not use milk wastefully in his calf feeding, but, on the other hand, he should not skimp blindly. There's no point in buying replacement feeds to save milk unless there is a worthwhile saving without sacrificing growth of the calf. Even if we give the replacer credit for being fully as good as whole milk (pound for pound of dry nutrients), we must be able to buy a 25-pound bag or package of the replacer with the net price received for 100 pounds of milk in order to realize a small saving.

MORE LAMB GAINS ON LESS FEED



These sheep men have developed a feeding program which means larger profits . .

Condensed from
Western Livestock Journal

Clay Robinson

SELF fed, chopped alfalfa hay and pelleted concentrates give greater gains on less feeds for lambs on the farm of George Corry and Sons at Delta, Utah. And, to help in feeding the Corrys have installed many movable self feeders which keep feed before the lambs at all times.

George Corry said the lambs gain about 1/3 of a pound per head per day while in the feed yards. The ration consists of grains and other concentrates in pelleted form. The pellets are made locally for the Corrys largely from their own, farm-grown grains and feeds. The mixture consists, by weight, of 5 parts barley, 5 parts wheat, 6 parts molasses dried beet pulp, 4 parts cotton seed meal, 5 parts molasses, and supplemental minerals.

The chopped alfalfa hay is kept before the lambs at all times in the self feeders. Also, regular baled alfalfa hay is provided free choice from mangers. The two types of hay encourage the lambs to eat more.

Efficiency and economy of gain on the lambs are great, inasmuch as very little feed is lost from trampling or wind blowing. The pelleted concentrates are readily cleaned up by the lambs and do not blow. The chopped hay is protected at all times from the weather by tight aluminum lids on the feeders and by the special construction of the feed outlets.

The self feeders are wider at the top than at the bottom so that the chopped hay falls into the feed outlets as the lambs eat. This design also provides overhead shelter to protect the feed outlets from storms.

Built on skids, the self feeders may be moved to permit easier cleaning of the yards or for rearrangement. The feeders are usually placed in such a way that they are easily filled from a feed truck that drives through the yards. Lambs may be kept out of the way during the filling

Reprinted by permission from Western Livestock Journal, Los Angeles, Calif.

by cutting them into an adjoining yard.

The Corrys keep their lambs in the feed yards about 50 to 60 days before topping them out. Some of the slower feeders may remain in the yards about 100 to 120 days. The yards are carefully watched to keep death losses at a minimum and to see that lambs are not kept on feed longer than necessary.

Although the Corrys feed lambs for a cash profit they don't overlook the value of the manure. They have found that livestock feeding, with the manure being applied to the soil, has increased yields on cash crops such as sugar beets. The manure has also increased yields of feed crops.

"The soil in this area is very heavy," said George Corry. We need more organic matter. That's why a livestock feeding program is so important."

Meat-Type Hogs Grade Higher For Top Price

The recently changed federal barrow and gilt carcass grades can mean an extra three dollars or more per cwt. at market time to the farmer who changes to meat-type hogs, according to Roie Godsey, Virginia swine specialist.

Godsey says under the new grades, meaty hogs will grade higher. Some buyers are already paying as much as $1.00 per cwt. more for the meatier hogs, and that price differential may become even greater.

Meat-type hogs reach market weight as soon and sometimes sooner than the lardy-type hogs. They make better gains on less feed. For example in one USDA test, they required about $1.25 less feed for each 100 pounds of gain than did lard-type hogs.

Godsey says to be sure not to confuse meat-type hogs with lean hogs, which have less muscle. The top-grade hogs not only have less fat but also have heavy muscling in the hams and loins.

The grades are now U. S. 1, U. S. 2, U. S. 3 and medium. Former names were Choice 1, 2, 3, and medium.

The U. S. 1, 2, and 3 carcasses will each have .2 inches less fatback than was previously required for choice 1, 2, and 3, respectively. The medium grade has been changed from a range of 1.1—1.5 inches to 1.0—1.3 inches fatback.

Several packers have been using grade standards similar to the new ones for some time, but up to now, most market hogs have been sold primarily on a weight basis.

Virginia Extension

They Grow Caponettes In The Woods

The risk is big, but so are the premiums when they hit the market right . . .

Condensed from Pennsylvania Farmer

Robert H. Williams

PIKE County is tucked in the northeast corner of Pennsylvania, a hilly, heavily-wooded piece of real estate admired more by summer visitors than by men who would make their living from the land. In recent years, however, some farmers have quit fighting stumps, rocks and side hills. Instead they grow caponettes in the woods—millions of them for the big Kosher trade in nearby New York City.

The caponette grower faces all the risks of the broiler grower, and a few more besides.

According to County Agent Bill Davis, 100 to 140 Pike county growers, depending on the market, ship close to 3,000,000 caponettes to New York City each year. It's an industry that grosses four to four and one-half million dollars annually.

Don't confuse the capon with the caponette. Capons are male chickens with their reproductive organs removed. They are usually raised in small farm flocks and forage for part of their living. They go to market at six to eight months of age and weigh about eight pounds. Caponettes are either cockerels or pullets that have been treated with diethylstilbestrol, the same hormone now fed steers. Caponettes are raised in large batches, much like broilers, and depend almost entirely on commercial feeds. They reach market weight of four to five pounds at 11 to 17 weeks.

The caponette men are converted broiler growers. That phase of the industry got its foothold in the county back in the twenties, Bill Davis says.

"A man came into my office one day in 1925 and asked for a fattening ration for chickens," County Agent Davis says. "We had never heard of such a ration in those days, but we figured one out and he used it." The ration worked and a broiler industry was born. The man who tried it and who is generally credited with starting the broiler industry in Pike County is the

Reprinted by permission from Pennsylvania Farmer, Pittsburgh, Pennsylvania

late Fred Graber, Sr., a retired businessman from Brooklyn. Mr. Graber had a flock of 800 to 1,000 birds and a family of nine children, most of whom are still in the poultry business.

Long before caponettes were first tried, Pike county broilers were famous. They once commanded a two cents a pound premium at the farm over Delmarva birds. One reason was the short haul to New York City —a mere 75 to 80 miles. Then came the impact of World War II. Broiler houses sprung up in the woods and business boomed. Recently, however, new broiler areas have teamed up with improved transportation facilities to shrivel premiums for Pike county broilers to microscopic proportions. Add a broiler bust or two and local growers had a sick industry.

In 1949, Milton Harrison decided to try caponettes. The Kosher trade in metropolitan New York prefer heavy birds with lots of yellow fat. And they pay a premium to get them.

By injecting cockerels and pullets with diethylstilbestrol, Mr. Harrison was told, he could get that sort of finish on his birds. The idea was an instant success. Today, Mr. Harrison and his two stepsons raise 200,000 caponettes annually and usually get five cents a pound over the broiler price.

Why hasn't the industry spread to other areas of the state? First, the caponette market is limited. The large Jewish population in metropolitan New York are avid fans of these birds, but elsewhere the demand is light. Marketwise growers say 100,000 caponettes per week is the saturation point for the huge New York Terminal Market where most birds go.

Also, the risk is bigger than most poultrymen like to take. Caponettes are kept from one to six weeks longer than broilers, thus the possibility of disease striking the flock is that much greater. Some believe the hormone makes the birds more susceptible to disease due to the "tenderizing" effect.

A third mark against the caponette business is the added job and expense of treating the birds. It takes four men about an hour to treat 1,000 to 1,500 birds at the Harrison farm. One "sticks" and three catch. It costs about two cents a bird for the hormone.

Poultrymen say this extra handling excites the bird, and could bring on chronic respiratory disease. Broiler growers try to avoid it, caponette men can't.

The men in the caponette business point out they run fewer batches through their houses each year because they hold the birds longer than broiler men. Also,

they get fewer birds in each house because they grow the birds bigger than broilers.

Despite these handicaps, Pike county growers continue to shoot for the premium market. Sometimes they hit the bullseye. Charles Hommel, a veteran of World War II who has built a former hunting camp into a virtual meat factory, received 55 cents a pound in March for three loads of 17-week-old hormonized pullets. Mr. Harrisin sold one batch of straight run Silver Rocks that same month at a farm price of 42 cents per pound—"the best in years."

Feed conversion on these big birds is good. Martin and Henry McKean say their best batch made one pound of gain for each 2.88 pounds of feed. The birds averaged 5.1 pounds at 13½ weeks. The McKeans did it with a high energy feed carrying about 20 per cent protein. Normal feed conversion at the McKeans is about 3.2 to 1 for 4½ pound birds. For five pound birds at still another farm, we were quoted 3.5-1 as a normal conversion. We heard of one grower who sold a recent batch of 10-week-old caponettes at an average weight of 4.4 pounds, fast gains in any league.

Does the hormone stimulate growth? Extension specialists point out that males treated with stilbestrol acquire some of the temperaments of pullets. They "put on more fat, feather faster, stop crowing and fighting, and their combs shrivel." Advantages of using the hormone on males isn't too great, they say, if the birds are marketed before 12 weeks of age. However, for heavier weights, the Extension men believe they do make faster gains.

The hormone is similar to the one secreted naturally in the ovaries of laying birds. It stimulates normal fleshing in pullets before they start to lay.

Caponette men treat both male and female. Meat-type pullets treated with this hormone feather faster and develop softer flesh and fat at an earlier age.

Cockerels and pullets are usually treated at seven to ten weeks of age. The effects of the hormone wear off after six to eight weeks. If the birds are being held for a longer period they get a booster.

A hormone paste injected with a hypo gun is gaining in popularity. One grower said the rabbis complained about pus pockets in the neck caused by pellets. The paste dissolves and leaves no pronounced disfigurement. This is important with New York-dressed birds because the head is not removed by the dressing plant.

Latest Hog Breeding Results

University of Minnesota animal scientists are calling on nature for help in developing superior hogs in the new No. 3 hog line. Nature helps with her law, "the survival of the fittest."

The method was described by L. M. Winters, professor of animal husbandry and developer of Minnesota No. 1, 2 and 3 hogs.

First, boars and gilts are chosen for past performance—that is, vigor and feed-using ability. Boars are left with females for only one heat period—about 10 boars to 50 to 70 females.

This multiple-sire system gives every female a fair chance of conceiving. And if a female does not conceive at first breeding, she is ticketed for the packer.

Boars that prove too lazy to breed are not "teased" or encouraged. Winters' philosophy is that if a boar is that lazy, they don't want any offspring from him regardless of how superior he might be in other ways.

Females farrow alone in houses at about 11 to 11½ months. The weak baby pigs die—the strong survive, just as in nature, to pass on their vigor to later generations.

How are the new Minnesota lines performing? Well, in recent tests crossbreds born of No. 1, 2 and 3 combinations took 317 pounds of feed per 100 pounds gain with a daily gain of from 1.6 to 1.8 pounds per pig.

The Minnesota crossbreds' superior weight-gaining ability built them to the 200-pound weight in about 140 days—and with a fifth less backfat than the common breeds.

Winters and his associates now are working on sub-lines of the three new breeds and hope to find out how well such superior line will "keep"—that is, maintain their desirable characteristics over a long period and several generations.

University of Minnesota

Better Protection From Zinc Paint

The best way to protect zinc or galvanized surfaces of farm structures from rust is to apply two coats of metallic zinc paint. It provides protection for about 10 years. A paint with 80 per cent zinc dust and 20 per cent zinc oxide in the pigment mixed with 90 per cent linseed oil and 10 per cent thinner and drier is recommended. To clean new galvanized surfaces for painting, use mineral spirits, turpentine, or about 6 months of weathering. Vinegar has no particular advantage as a cleaner.

Foreign Farm Youth Learn American Ways

This program aims at international understanding . . .

Condensed from Nation's Agriculture

FARM youth from foreign countries soon will be on U.S. farms "living an experience" of what the United States is really like.

And, when they return to their native lands about a year from now, they will have been exposed to "learning by doing."

They will also be in the unique position of being able to foster better understanding between the peoples of their country and this nation.

On the other hand, during the months ahead, American farm family sponsors of these youths will be absorbing information from their trainees about their homes and native lands.

December, 1953, at the annual convention of the American Farm Bureau Federation, the voting delegates adopted a resolution on international exchange of farm people.

The thinking behind this resolution was that farm people have always been interested in programs designed to improve international relations.

So, they reasoned, what could be better than bringing foreign folks to our shores and letting them actually live with American farm families?

To carry out the resolution of 1953, the AFBF Board of Directors approved a program, which was developed in cooperation with the Foreign Operations Administration, to bring about 200 young farmers between the ages of 18 and 30 from other countries to live and work on farms in the United States in 1955.

The program calls for expanding the number of participants to 400 in 1956.

National farm organizations in

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Fertilizing Through Irrigation

There are many factors to be considered when fertilization is applied with irrigation water . . .

Condensed from The Rural New Yorker

Malcolm H. McVicar

ALTHOUGH there are disadvantages to applying fertilizer through irrigation systems, the operation can be practical on many farms.

Many fertilizer materials can be applied through sprinkler irrigation systems. It means doing two important jobs at one time; the fertilizer and water can both be put on in one application with only a little more labor required than for just applying water.

The placement depth of nitrogen fertilizers can be closely controlled, too. Nitrogen moves freely in the soil and will penetrate as far as the water. However, the uniformity of fertilizer distribution depends on the uniformity of water distribution. And that is one of the real problems involved in applying fertilizer through a sprinkler system.

There are other problems to this method of fertilization. Because the fertilizer must be soluble in water, many of the cheapest forms of plant food cannot be used. It is impossible, too, to make localized placement. For example, at corn planting it is impossible to band fertilizer, a practice which keeps fertilizer from touching the seeds but which makes plant food immediately available to young seedlings. Irrigation fertilization does, however, place nutrients close to tiny plants within reach of the roots.

Another disadvantage of applying fertilizer through irrigation is when phosphate materials are used: applied through an irrigation system, phosphates concentrate near the soil surface rather than in the plant root zone where they are of the most value. Phosphates do not move freely through the soil; a farmer cannot rely on their being carried down by irrigation water.

The amount of fertilizer to be applied per acre depends on the particular soil involved, on the fertilizer being applied, and on the crop itself. The county agent

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or land grant college can well advise on how much actual fertilizer to use under specific conditions. Irrigation will not, of course, take the place of fertilization; and fertilizer will not take the place of water. The two act as a team, each making the other more effective. Adequate quantities of fertilizer make each drop of water most effective; and ample water makes

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Both of these factors are essential to success.

The recommended irrigation-fertilizing procedure involves three time intervals: during the first period, only water is pumped through the system; during the second interval — which should not normally be less than one-half hour — the fertilizer-water solution is injected into the system; and during the third and final interval, just plain water is again pumped through the pipes. Sufficient water should be applied during the last interval to completely rinse out the system and also to remove all fertilizer from the plant foliage.

Not more than five pounds of fertilizer should be applied per one hundred gallons of water. The following equation can be used for figuring the amount of

One of the simplest and most common ways of injecting fertilizers into a sprinkler system is by the two-valve system. A valve and hose are set up on the discharge side of the pump to a 55-gallon drum where the water and fertilizer are mixed. A second valve and hose are provided on the suction side of the pump to draw the mixture into the system. The rate of intake is ad-

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It all goes to show that farming is like any other business . . . .

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or land grant college can well advise on how much actual fertilizer to use under specific conditions. Irrigation will not, of course, take the place of fertilization; and fertilizer will not take the place of water. The two act as a team, each making the other more effective. Adequate quantities of fertilizer make each drop of water most effective; and ample water makes each pound of fertilizer do its best. A plant which develops a strong root system is able to take up water from a larger soil area than a plant with a small root system.

Less water is required to produce a unit of crop at high fertility levels. The wise farmer putting in an irrigation system takes stock of both fertility and water.

Success of an irrigation layout depends on two major factors: 1—the system must be designed to fit the farm, and 2—it must be operated in accordance with the standards of original design. Both of these factors are essential to success.

The recommended irrigation-fertilizing procedure involves three time intervals: during the first period, only water is pumped through the system; during the second interval — which should not normally be less than one-half hour — the fertilizer-water solution is injected into the system; and during the third and final interval, just plain water is again pumped through the pipes. Sufficient water should be applied during the last interval to completely rinse out the system and also to remove all fertilizer from the plant foliage.

Not more than five pounds of fertilizer should be applied per one hundred gallons of water. The following equation can be used for figuring the amount of fertilizer to put through the system: Pounds of fertilizer to inject per lateral equals Length of lateral times Widths between successive laterals times Rate of fertilization desired per acre, all divided by 43,560 (number of square feet in an acre). Symbolically, the equation can be expressed as P equals LWR÷ 43,560. Thus, if the lateral is 300 feet long, the distance between it and others 100 feet and the desired rate of application 200 pounds per acre, the amount of fertilizer to apply per lateral is 137 pounds.

One of the simplest and most common ways of injecting fertilizers into a sprinkler system is by the two-valve system. A valve and hose are set up on the discharge side of the pump to a 55-gallon drum where the water and fertilizer are mixed. A second valve and hose are provided on the suction side of the pump to draw the mixture into the system. The rate of intake is ad-

justed by means of the valve on the suction side of the pump.

Another method of applying fertilizers and water at the same time involves the use of a Venturi tube in the discharge line. This method is applicable regardless of the type of pump used. The Venturi tube, connected by a pipe to a closed supply tank, forms a circuit of water flow from the main pipe line to the Venturi throat (small part of tube).

Positive displacement pumps are sometimes used to inject the fertilizer-water mixtures into the sprinkler system. They are particularly applicable when the system is operated from a deep-well turbine pump.

Most farmers do not have the technical ability to design a properly engineered system. Farmers should purchase their sprinkler systems from a reputable dealer who can furnish engineering assistance to insure proper design and layout. It is very important that the system fit the individual farm.

Farmers inexperienced in irrigation often do not realize the large quantities of water needed for irrigation. To apply 10 inches of water on a 10-acre field requires the water from a pond an acre in area and 12 to fifteen feet deep. An abundant water supply is essential for successful operation of the system. The water source should be checked by an authority before a sprinkler irrigation system is installed. To get miximum returns from an irrigation investment, high production is necessary. This means a lot more than just putting water on when the soil gets dry. It requires high fertilization, good rotations and all-around good cultural practices. It also needs good management.

Well Managed Sheep Can Be Very Profitable

A farm flock of sheep, properly managed, is a profitable enterprise on many farms, according to J. S. Buchanan, North Carolina animal husbandry specialist.

Buchanan says the outlook for prices that farmers will receive for lambs and wools this year is very encouraging and that some farmers would do well to either start or expand a sheep flock.

According to farm flock records turned in by 42 sheep producers in 12 different counties in North Carolina in 1954, the average gross income from the sale of lambs and wool was $25.42 per ewe. The average cost of keeping a ewe for the year was reported as $6.80, leaving a net profit of $18.62 per ewe.

How to Control Household Insects

Insects of many kinds invade farm homes. Here are latest methods of control . . .

Condensed from The Southern Planter

Dr. George S. Langford, University of Maryland

NOTHING exasperates a homemaker as much as finding her home invaded by insects. Yet, no home is safe from their invasion. Regardless of how fastidious one may be there will be times when insects gain entrance and cause trouble.

Ants, cockroaches, bedbugs, silverfish, fleas, clothes moths and carpet beetles are a few of the more common insects that occur in homes and require attention from time to time. To this list must be added the ever present house fly and mosquito.

A few years ago the control of household insects was difficult and often trying. But today we have so many new and efficient insecticides that control, in most instances, is quite easy. Here are a few hints for fighting some of our more common household pests.

Ants. All summer long ants invade homes and make a nuisance of themselves. Most ant infestations can be eliminated by the proper use of Chlordane. Get the 2 per cent household type and apply it with a paint brush or small sprayer to baseboards, door jambs, walks and around the base of cupboards, cabinets, table legs and other objects over which ants crawl in gaining entrance to the house, or place it where they are foraging.

Look for the nests. They are usually outside the house, or in the lawn. These should be treated by either dusting with a 5 per cent Chlordane dust or by spraying with a 2 per cent Chlordane solution prepared from an emulsifiable concentrate.

If the whole house is being over-run the above treatments should be supplemented by spraying all outside portions of the building from the ground to the first floor windows with 2 per cent Chlordane as an emulsion in water. Be sure that all porches, steps and objects under the house, such as pillars and pipes over which the ants can crawl and gain entrance to the house, are

Reprinted by permission from The Southern Planter, Richmond, Virginia

sprayed.

Cockroaches. Roaches are among the most common and offensive insects found in the home. They hide all day and come out at night to frolic over, feed upon, and foul with excreta, foods of all kinds. Because of their nocturnal habit, they often become well established before they are noticed.

The first step in roach control should be a thorough cleaning of the kitchen, pantries and other places in the home where the roaches live and feed. This should be followed by thoroughly spraying or painting all protected situations where the roaches hide or congregate with Chlordane. Use either as a 2 per cent solution in deodorized kerosene (household Chlordane) or as a 2 per cent emulsion in water. The spray should be applied to all shelves and baseboards, under sinks, around drain pipes, in dark closets and to any cracks in walls where roaches are likely to hide.

Bedbugs. Even though the mention of this insect creates consternation among most homemakers, the fact remains that the bedbug is a close companion of man and follows him wherever he goes. As long as we travel and sleep in strange places bedbugs may be expected. It is possible to pick them up in theaters and other unexpected places. Should they become established in the home they can now be easily controlled.

A thorough spraying of the beds, mattresses, baseboards and cracks in walls where they hide with 5 per cent household DDT will usually free the premises of them.

Occasionally, homes may become infested from bats, birds or other animals taking up lodging in the attics or walls of a home. In such instances it will be necessary to eliminate these animals. It may even be necessary to have the home fumigated.

Silverfish. Closets, storage trunks, pantries and bookcases are among the places where silverfish like to forage and hide. These silvery and grayish fish-like insects are not uncommon in old homes, and they frequently do considerable damage. They damage and deface wallpaper and bookbindings, destroy papers and eat holes in starched clothing. They may be controlled by dusting or spraying with DDT, Chlordane or Lindane. Use standard household formulations and thoroughly treat all areas where the insects abound and cause damage.

They may also be controlled by scattering in the scheduled places where the insects are found a poisoned bait prepared by thoroughly mixing 1 pint of finely ground oatmeal, one-third teaspoon sodium fluoride, three-

quarter teaspoon of powdered confectioner's sugar and one-third teaspoon of powdered table salt.

Fleas. Anyone owning cats or dogs may experience a flea problem if the animals are allowed in the home.

If fleas become established or bothersome in the home they may be brought under control quickly by spraying the floors and lower walls of the infested room or rooms. Use a 5 per cent DDT or a 1 per cent Lindane household spray. Light sprays of these materials may also be applied to upholstered furniture and to beds and bedding.

When the flea infestation is centered outside the home and around barns, hog lots, outbuildings, or yards the infestation may be eliminated by removing all litter and manure from the infested area, and then spraying the area, ground included, with a 1 per cent solution of DDT in water. Lindane or BHC also make good sprays for this purpose.

Clothes Moths. Woolen clothing, blankets and furs often have holes eaten in them by small caterpillars or worms, the adults of which are called "clothes moths." An infestation can usually be identified by the presence of silken cases of threads scattered over the surface of the damaged material. Small buff-colored moths may also be found running over the surface of the infested materials.

Clothing and other woolens that are to be stored should be thoroughly aired, sunned, and brushed before being put away, and when stored in trunks or boxes they should be packed with a liberal supply of napthalene flakes or paradichlorobenzene crystals. Moth-proof bags provide good protection, particularly if napthalene flakes or paradichlorobenzene crystals are added as they are sealed. Clothing that is worn regularly is not subject to attack.

Infested closets, bureau drawers and chests should be thoroughly cleaned and treated with a 5 per cent DDT household spray. The fogging of closets with aerosol bombs containing DDT is also effective for killing any moths present. Clothing may be left hanging loosely in closets at the time of treatment.

Carpet Beetles. Like clothes moth larvae, carpet beetle larvae eat holes in woolen clothing, rugs, upholstery covers and feed in the padding of furniture that contains wool, feathers, hair or fur. The larvae of this insect differs from those of clothes moths in that they do not form silken cases or web the material on which they live. They are usually stout brown worms covered with tufts of long hairs.

Infested rugs or carpets should be sunned, beaten, brushed and thoroughly cleaned by vacuum sweeping, and then sprayed on both sides with a household spray containing Lindane. Since these larvae also hide in floor cracks, under baseboards and other similar locations, the spray should be applied to such places following a thorough cleaning.

The Housefly. The fly's disgusting habit of feeding on filth and then associating with human food makes it one of our most repulsive insects. It is capable of collecting and carrying on its feet bacteria that cause many human diseases. Yet, few homes are entirely free of houseflies during the summer months.

Basically, good fly control is dependent on good sanitation in the community or on the farm. Failure to eliminate or properly dispose of manure, garbage, dead animals or other wastes in the vicinity of the home will result in an abundance of flies. The thorough screening of all windows and doors is a must if flies are to be kept outside of the home. Those that gain entrance in spite of screens may be destroyed by the liberal use of household sprays containing pyrethrum.

A sweetened bait prepared by mixing 2 ounces of 50 per cent Malathion emulsion and 2 pounds of sugar in 2 gallons of water is effective for destroying flies outside of the home. The bait should be sprayed lightly around porches, garbage cans, in barns and other places where flies collect or become abundant.

Mosquitoes. Mosquitoes in the home can be most annoying. Anopheline mosquitoes are responsible for the transmission of malarial fever which still persists in certain sections of the South.

Like fly control, mosquito control lies largely outside the home. Mosquitoes breed in water. Because of this, the most fundamental means of control is the elimination of all standing water through drainage or other means. Useless receptacles which may hold water, such as tin cans, rain barrels, etc., should be eliminated.

The screening of all windows and doors will go far in keeping most mosquitoes out of the home. Household insecticides may be used to kill those that slip through. The space spraying of rooms an hour or so before retiring with insecticides containing pyrethrum or DDT will kill any mosquitoes present. Aerosol bombs containing the above chemicals are also effective.

When the walls of a room are sprayed with 5 per cent household DDT they are lethal to mosquitoes that light on them for a period of several weeks.

SUBSOILING — WHEN WILL IT PAY?

Will it pay on your farm? Here are some of the answers . . .

Condensed from Successful Farming

John Howard

INTEREST in the subsoil has suddenly taken a spurt. Reason? There seem to be several. More powerful tractors and redesigned equipment have sent dozens of machinery dealers in search of a market—their tests and demonstrations have sometimes set a whole community on a subsoiling spree.

Recent emphasis on fertilizer has naturally encouraged a few farmers and professors to go below plow depth with an assortment of deep fertilizing tools—mostly homemade, though one deep applicator is being marketed.

Besides direct effect on yields, subsoiling has come into its own in some areas by helping control water—speeding drainage in low fields, increasing water intake on slopes and in terrace channels.

And soil compaction, apparently a by-product of the plow and the rubber-tired tractor, can sometimes be remedied by subsoiling done properly.

You can find stacks of research reports at practically any agriculture college showing subsoiling doesn't pay. And that is good research. But does it apply to 1955? More important does it apply to the soil on *your* farm?

First, let's break up this subsoil business into its different categories.

There's s t r a i g h t chiseling. That's where you operate a machine usually with one or two long teeth at a depth generally below 12 to 16 inches—maybe as deep as 30 inches. This fractures the subsoil very efficiently if done when the soil is dry. The spacing between chisel marks may vary from 2 feet on out.

Then there's a practice we can call deep tillage. That's stirring the whole soil at least below plow depth with any of a number of tools that may look like a super field cultivator or an oversize disc plow.

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Lastly, there's deep fertilizing, which means putting fertilizer down into the subsoil. And, of course, you get one of the above two operations—chiseling or deep tillage—as a by-product.

Where are they using these three varieties of subsoil operation? Also, what do we know about their success?

Farmers are getting some of their best results from chiseling in drainage control. If you have low spots, it's worth considering. Chiseling is also being used on slopes to collect water that would otherwise run off. This, too, has a lot of appeal following a string of years when stored moisture has made more than one corn crop. This water intake also reduces terrace and waterway maintenance.

Edgar Wahling of Shelby County, Iowa, has used a chisel for runoff control for five years. He chisels all sod land that goes to corn, or once each round of his 5-year rotation of corn, corn, grain, and 2 years of alfalfa-brome. The chiseling is done on the contour and in the fall. He has had no runoff from sod ground in the five years.

On terraced land, Wahling usually chisels only the channel. The trench left by the chisel in the terrace or diversion channel has not been freezing shut during the winters.

Wahling pulls a single chisel 20" to 22" deep with a 3-plow tractor. Using a 10-foot spacing between chisel marks, he can chisel 7½ acres per hour. Gas consumption runs 2½ gallons per hour.

There's R. L. Anderson of Glidden, Iowa, who has 80 acres which can't be tile-drained because of lack of an outlet. It was previously called the "lake 80" because of its many potholes. Yet in 1954, with a total of 45" of rain—19" after August 1—about 40 bushels of beans per acre were harvested from this field.

In the fall of 1952, a Manteno, Illinois, implement company subsoiled test plots on about 60 farms in the Kankakee Soil Conservation District. Farmers driving past would stop, watch, and in a short time begin getting their own subsoilers.

The second year, at least 40 farmers in the Manteno vicinity were subsoiling. Now a subsoiling research project has been set up by the U.S.D.A. and the University of Illinois in that area.

What about yield increases from subsoiling where drainage is not a big factor? There are a lot of unanswered questions.

A recent 5-year test on a clay-pan soil (that's a tight layer of clay at about 15 to 20 inches) in Missouri did not increase corn and wheat yields—in fact it hurt them. Shattering was 18 inches deep. But taking just 1

year's test, Dr. Helmut Kohnke at Purdue had increases of over 5 bushels per acre on 9 out of 16 chiseled fields in 1954.

In the high plains, it's well proved that chiseling is beneficial to wheat where a "pan" has formed just below where the one-way disc has cut.

This brings us to the next phase of subsoiling, that of deep fertilization. At least one company is selling a chisel equipped to meter fertilizer into the subsoil. Others are on the way. One of the *key* figures in this is Doctor Kohnke, mentioned above. He launched large-scale tests of subsoil fertilization in 1953. That year, his tests showed an average of 28 per cent (22 bushels) higher corn yields when 1,000 pounds of 10-10-10 plus lime were put in the lower half of a 20-inch-deep slit.

He repeated the tests in 1954 on 18 different farms and obtained increases of 5 bushels or more over either chiseling alone or discing in the fertilizer in about ½ of the cases. The question to be answered with deep fertilization is whether broadcast treatment in the plow layer is not just as good as subsoil application.

D. D. Smith of the University of Missouri has 10 years of tests with deep fertilizer placement on clap-pan soil. His conclusion so far, on that soil, is that deep fertilization about breaks even profitwise.

Deep tillage, where the entire soil is stirred down as much as 18 inches, is part of the whole picture but less clear-cut as a practice. It helps if we think of it as simply deepening the plow layer or building a deeper root zone. Usually, heavy amounts of fertilizer are applied, and we'll be hearing more about this as tests progress. Some well-known agronomists feel this may be our next big step in upping yields.

How do we know if any of these ideas will work on our own farms? There definitely must be a tight layer somewhere between plow depth and say 25 inches for subsoiling to do any good. You can check for this with a spade. A tight layer will break out as a hard chunk. Above and below, it, the soil breaks away.

What do these machines cost? A simple mounted chisel costs around $60. Big custom-built subsoilers, used in the West, run into the thousands.

If you do decide to subsoil, do it when it's dry or you'll smear through the soil and do more harm than good.

How do you know if it's dry enough? C. H. Diebold, of the U. S. Soil Conservation Service, takes a ball of earth from the subsoil and tosses it a foot high and catches it five times. If the

ball breaks, he says to go ahead. If the ball remains intact, don't chisel. Late summer or fall is the only time the soil is usually dry enough.

Subsoiling should always be deep enough to go under the tight layer—this lifts and cracks the "pan." For breaking up a tight layer or applying fertilizer deep, the chisel marks would usually be spaced 2 to 3 feet. For drainage and runoff control, the spacings can be farther.

Within the next 5 to 10 years, we're going to learn a lot more about subsoiling. We may eventually have the subsoiling counterpart of a soil test. Then we'll know exactly when to chisel.

Grass silage gives best results when fed in combination with hay, according to the dairy department at Purdue University. Five to seven pounds per cow daily in addition to all the silage a cow will eat gives good results. When cows are fed only grass silage they will generally not consume as much roughage (in terms of dry matter) as when both silage and hay are fed.

His Multiflora Rose Spreads

"Some Missouri farmers are faced with a problem of spreading in Multiflora rose. I think plantings must be 8 or 10 years old before spreading shows up. Since few plantings have been in that long I believe more spread will be showing up from other sections of the country.

I have a planting that was put out 15 years ago by the C.C.C. There are 10 of these early plantings in Livingston County. They are all spreading. My tree planting is so thick you can't walk through it. I have found spread 7 miles from any known planting. It is almost across Livingston County from north to south. I know of some plantings that have been planted 8 years that have started spreading.

Several people tried sprays last summer. Some used brush spray on leaves, others on leaves and basally and others used weed spray various ways. None received a kill.

I think some spray will be developed but why put multiflora out to farmers and continue to represent it to not spread or become a serious problem?"

Francis Steele
Rural Route 2
Chillicothe, Missouri

The Commodity Market

Busy, exciting, competitive . . . that describes where the price on your crops are set . . .

Condensed from The Young Farmer

C. M. Thompson

ACROSS the nation there are 65 major commodity markets. At these well-organized and highly competitive market places, buyers and sellers meet, agree on a price, and establish the day to day prices of 19 farm products.

It goes without saying that farmers who sell these products should be intensely interested in the operations of the commodity markets. But so should the farmers who buy back these products in the form of livestock or poultry feeds. For here are determined the prices the farmer pays for what he buys as well as what he receives for the things he sells.

In the old days, marketing farm products was an uncertain, time-consuming, and expensive operation. This is no longer true. The modern commodity markets have developed a high degree of efficiency. Today's farmer has no trouble selling his crops quickly and economically. He is also protected against corrupt or unfair marketing practices.

All commodity markets are licensed by the Secretary of Agriculture and are governed by rules established by the Commodity Exchange Act of 1936. In addition, each market has its own self-governing board which regulates all transactions and enforces trading rules among the members.

Only members of the market may engage in trading. And anyone can become a member. All applications for membership, however, are carefully screened to make sure the applicant has a good record for financial stability and personal integrity.

Many market members act as brokers for persons who are not located at the market or who do not have their own memberships. Brokers, who must follow the rules of the market scrupulously,

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General Mills, Minneapolis 1, Minnesota

buy and sell on commission for their customers.

Because different crops are grown in different parts of the country, all commodity markets don't handle the same products. The principles of marketing are the same, however, at all commodity markets regardless of the products traded. Wheat, a typical commodity, will be used as an example in this article. But any other commodity can be substituted and the same rules will apply.

Forty-five of the major commodity markets are cash markets, the other 20 are actually two markets in one—a cash market and a futures market. Let's take a look at each one of these.

Cash Market

The cash market is where the commodities actually are transferred from seller to buyer. Every day, huge quantities of commodities arrive at the major markets by rail, truck, and barge from country markets and outlying elevators. These shipments are graded by government inspectors, and samples of each shipment are displayed in the open cash market. Grade and quality slips are attached to each sample. Prospective buyers look at the samples and "shop around" until they find the quality they want. Then they talk to the sellers and establish a price agreeable to each. As the name implies, cash payments are made on all purchases and the buyer takes immediate possession of the commodity.

Futures Market

The futures market is probably the most misunderstood of all. It shouldn't be. The principles of trading in futures are simple.

All that a futures sale involves is that the seller and buyer meet and agree on a price and a future delivery date of the product sold. The buyer deposits a percentage of the cash value of the product to guarantee he will accept delivery. This deposit is called a margin.

You make a futures trade if you order a tractor from your implement dealer, give him a deposit to show you're serious, and pay the remainder when the tractor arrives.

There are three good reasons for the farmer to be interested in the futures market. First, it helps minimize violent price fluctuations by making a year around market for seasonal crops. Second, it provides a way for processors and handlers of farm products to protect themselves against losses caused by changing markets. This makes a saving which is passed along to the consumer in the form of lower prices and to the farmer in lower han-

dling charges.

And third, the futures market can be used by the farmer as "business insurance."

The marketing operation used to obtain this protection and insurance is called hedging. Here are two examples of how it works.

The operator of a country grain elevator is a typical hedger. His business is storing the farmer's grain and providing the farmer with market facilities. His profit comes from the charge he makes for these services, and he doesn't count on profiting when he resells the farmer's grain. Nor does he want any losses resulting from this resale.

The farmer brings his grain to the elevator when he wants to sell. The elevator operator pays him the price the grain is bringing at the nearest commodity market, less transportation and handling costs. The operator now owns the grain but, because it may take a week or ten days to get it to the market, his position is precarious. The price of grain can easily go down in this period. If it does, he takes a loss.

To protect himself, he sells a futures contract at the same time he buys the grain. *Futures prices and cash prices usually go up and down together so any losses he suffers in one market will be made up by gains in the other market.*

Here's how it works in practice.

On September 20, a farmer brings 5,000 bushels of wheat to Ed Jones, who operates a country elevator in North Dakota. The Minneapolis market for the day is $2.00 per bushel for the type of wheat the farmer has. So Jones pays the farmer $10,000, less transportation and handling costs.

The December futures market on the same day is $1.80 per bushel. Jones instructs his broker at the market to sell 5,000 bushels on the futures market for December delivery. This is called selling a futures contract.

A week later, the grain arrives at the cash market where the price has dropped to $1.90 a bushel. This means Jones will only get $9,500—a loss of $500. But the futures price is also down —to $1.70 per bushel.

At the same time Jones' wheat is sold on the cash market, his broker buys back a futures contract for 5,000 bushels of wheat. Here Jones makes a profit. He sold the contract for $1.80 but it only cost him $1.70 to buy it back so he has profited 10c per bushel—or $500. This offsets his loss on the cash market and he comes out even.

An outline of the transaction would look like this:

Sept. 20:
Jones buys 5,000 bushels of wheat at $2.00. This costs him $10,000

Jones sells a futures contract for 5,000 bu. at $1.80. For this he will be paid	9,000
Sept. 27:	
Jones sells 5,000 bu. at $1.90 on cash market. This brings him a total of	$ 9,500
Jones buys 5,000 bu. on futures market for $1.70. This costs him	8,500
Totals (Cash Market)	
Jones paid for wheat	$10,000
Jones got for wheat	9,500
Net loss	$ 500
Totals (Futures Market)	
Jones sold futures contract for	$ 9,000
Jones bought back futures contract for	8,500
Net gain	$ 500

The net loss balances the net gain.

This is the same type of hedging operation carried on by all handlers and processors and it works on the same principle for all products traded in the commodity markets.

Hedging doesn't often work as precisely as our example because the futures market and the cash markets don't always rise and fall exactly together. They are close enough, however, for hedging to be practical. Now let's see how a farmer can hedge his crop to insure it against a fall in market prices.

In early August Farmer Brown looks over his wheat crop. He likes what he sees and is almost positive that come September, he will harvest 4,000 bushels of wheat. But he has been watching the market closely and all the forecasts have been pointing to a bumper crop—and the strong possibility of a drop in wheat prices at harvest time.

The more Farmer Brown thinks about it, the more positive he is that the forecasts are right. All the wheat in his area looks good. The weather also looks good. Nor can he see any signs of extensive crop damage due to insects or disease.

He has been watching the futures market closely and has noticed a gradual drop in September futures prices. On this day, the futures market for September delivery is $2.30 per bushel. Brown knows he can make money if he can get this price. The question he has to decide is whether the price will be above $2.30 when he harvests—or whether the market will break and go under $2.30. Brown decides to sell for $2.30, which he considers a fair price, instead of waiting and taking the risk of getting less.

Here's where the futures market comes in. Brown calls his broker and orders him to sell a futures contract for $2.30 on the September market. But Brown doesn't sell all 4,000 bushels he expects to harvest. He's a firm believer in not counting his bushels until they're in the bin. So to play safe, he sells only 2,000 bushels. This gives him protection against any damage that still might overtake his crop.

Now, for all practical purposes, Brown has sold his crop—or at least part of it—at a price he considers adequate. But at harvest time he may have another decision to make. The futures market deals only in average quality contract grades. If his crop turns out to be of very high quality, it may pay him to sell it on the cash market because quality wheat often gets a high premium. If he wants to sell his wheat on the cash market, all he has to do is buy back his futures contract and sell the wheat to his local elevator operator.

Let's see how Brown made out, assuming he got at least a 2,000-bushel yield. For every nickel the market fell below $2.30 at harvest time, Brown made $100. The only cost to him would be the brokerage charge of $3.60 per thousand bushels traded. He would, of course, lose a like amount for every nickel the market advanced over $2.30. This makes him look like a speculator—but he actually is operating much more conservatively than the farmer who waits out the market—betting it will go up.

For Brown sold when he knew he could get a fair price. And he sold when all of his information and his own judgement told him the market was more apt to go down than to go up.

This type of hedging is not recommended for amateurs. But the average farmer is certainly capable enough to operate this way if he studies the markets closely. And the rewards are often well worth the effort.

Speculators

Every commodity market has speculators. They trade in futures contracts in the hope they can make a profit by buying and selling as the markets fluctuate. Most speculators don't want to take actual delivery on the contracts they hold. The speculator buys a futures contract because he thinks the market will rise and he can sell it for a higher price.

Speculators perform a definite service. For one thing, they establish a year-around market for seasonal crops. If all the wheat had to be delivered at harvest time, the market would be flooded and the price would drop disastrously. This doesn't happen because the speculator buys in the hope that the price will go up several months later.

Often the speculators are the only ones willing to take the "other side" of a futures contract. When Farmer Brown sold his wheat, for example, the speculators may have been the only persons who thought that the price would go up.

Speculators, of course, must abide by all of the regulations set up by the government and

the local market governing board.

This, then, is a brief, oversimplified picture of the workings of the commodity market. If you want further information on your own markets (and you should because marketing is vitally important to you), contact the secretary of the nearest commodity market. He will be happy to give you all the information you need.

The better you understand marketing, the better you are going to be able to market your crops. And intelligent marketing means bigger returns for your work.

Breed Influences Cream Production

The breed of dairy cow and not the feed has the most influence on the fat test of milk, says Dr. T. R. Freeman of the University of Kentucky. "Ranking from highest to lowest in the richness of their milk are Jerseys, Guernseys, Brown Swiss, Ayrshires, and Holsteins," he states.

"Even within a given breed there is much individual variation among animals in the fat content of their milk. This variation is probably the next most important factor in explaining differences in fat tests.

"Although it is recognized that the health of the cow may influence the fat test of her milk, it is not possible to predict just what that influence may be. A diseased cow may be producing milk which is high, low or normal in fat content.

"Generally speaking, as the age of the animal increases the fat test of her milk decreases slightly. This drop in fat test amounts to only about one-half of one per cent, on the average. A seasonal trend in the richness of herd milk has been observed. Usually the fat test is highest in winter and lowest in summer.

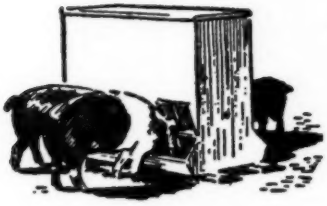
"As the stage of lactation of cow advances the fat content changes. For about the first two months the fat drops slightly, remains fairly constant for two or three months and then increases gradually.

"Conditions related to milking operations may affect the fat test of milk. The first portion of milk drawn is much lower in fat than the strippings. If the intervals between milkings are not the same, the milk drawn after the shorter interval will test higher. There is also some variation in the fat content of milk from the different quarters of the udder.

"The kind of feed which the cow receives will normally have little or no effect on the fat test of her milk. Seemingly, however, feeding a ration deficient in roughage may reduce the fat test."

Kentucky Extension

MORE HEALTH-CERTIFIED HOGS



You can now buy hogs with assurance that they are free of disease . . .

Condensed from Farm Journal

Dick Braun

HOG MEN are forced to gamble on disease every time they buy breeding stock.

That's why the biggest hog news in years is a health certification program now spreading across the Corn Belt.

Already you can buy breeding stock from herds that are health certified. There are about 20 such herds in Indiana alone. That may be too far from your farm, but the program is moving closer. The idea has spread to Iowa, Wisconsin, and Michigan.

Iowa and Wisconsin certification programs are already rolling. Breeding stock from h e a l t h certified herds in those states should be up for sale this fall. It may take slightly longer in Michigan, where program rules are just being drawn up. Ed Miller, extension swine specialist and one of the men who fathered the Indiana program, is now pushing the Michigan movement.

The programs will work something like this, with minor variations:

After passing two rigid veterinarian inspections, one to three months apart, a herd gets a health certificate. It keeps the certified rating as long as it passes two "physicals" a year. If it flunks, the herd owner must stamp out the disease, clean up, and repeat the entry inspections.

Veterinarians check for communicable diseases such as brucellosis, astrophic rhinitis, transmissible gastroenteritis (TGE), dysentery, cholera, anthrax, vesicular exanthema (VE), erysipelas, and tuberculosis.

Probably there isn't a herd of hogs in the Midwest that hasn't felt the sting of one of those in the past few years. No wonder the health certification movement is spreading like a litter of scared pigs.

Hoosier farmers, pioneers in the program, were eager to tell what health certification has meant to them.

One buyer out of every three

Reprinted by permission from Farm Journal, Philadelphia, Pennsylvania

or four shows unusual interest in the health certificate. It often makes the sale. Most interested is the guy who's been wiped out by a hog disease, and there are lots of that kind.

"Yes," says Bob Parkison, president of Indiana Swine Breeders Association, Inc., "buyers are now realizing the value of disease certification. We've just sold hogs to a couple of rhinitis victims."

Elmer Laughner, Clinton County, Ind., never sold a hog outside the state before. This year farmers came from Wisconsin and Minnesota to buy breeding stock, so they could start clean herds. This Hampshire breeder doesn't just sell hogs, he buys his own breeding stock from certified herds!

Once your herd is clean, the pressure is really on to keep it that way. And that's one of the big advantages of the program, breeders say.

"It's made disease watchers out of us," says Manford Stewart. With about one-third of their customers asking for disease-free stock, Manford and his dad know they have to come through.

As Bob Orr, Tipton County Duroc breeder, sees it, a health certificate helps the purebred man even more than his commercial hog-raising customers.

"If I sell a boar to a guy now, and disease bobs up in his herd, I have proof that my hog didn't bring it in." Breeders are always open for sharp accusations when that happens, whether or not they really are at fault. So the health program protects them.

Another thing, the program won't allow a breeder to lend or borrow boars, or let someone bring sows on the place for breeding.

"Makes a fellow feel safer," says Laughner.

Trouble is, there's still only a dribble of breeders entering the program. Why?

About 10 pounds of a live 240 pound "porker" end up as centercut pork chops; about 29 pounds are ham. All in all about 115 pounds of meat and 35 pounds of lard from the original pig are what's left for sale over the meat counter.

"Scared," says one purebred hog man. "If disease knocks you out of the program, it might hurt your sales. And there are still lots of breeders who'd rather sell disease than not sell at all."

But if you raise hogs, you can force purebred breeders to get certified ratings. Simply refuse to buy stock from an un-certified herd.

"Do that," says a Wisconsin livestock specialist, "and we'll have lots of health certified herds in a couple of years."

Practices That Cut Broiler Costs

New plans call for smaller pens, pellet feeding and use of feeders that reduce waste . . .

Condensed from Poultry Tribune

Fred Masterson

● REVISED MANAGEMENT PROGRAMS, designed to cut production costs, are being put into use by many New England broiler growers.

These poultrymen have always been known for their progressive practices. But the low prices which have prevailed, plus constantly increasing competition from other areas, have made them realize that "belt tightening" changes must be made.

Under past conditions, poultrymen were not in a position to invest large sums of money to build houses or improve old ones. Since breeding improvements take time, they can't depend on better chicks to solve all their problems. Market patterns, as far as size of birds is concerned, are well established. So raising larger or smaller birds isn't the answer.

After reviewing all these factors, broilermen have come to the conclusion that the surest and quickest way to improve their position is by adopting better management practices.

Tests conducted on broilers in the past have shown that 60 to 70 per cent of the feed consumed goes for body maintenance. The remaining 30 to 40 per cent is used in making gains.

George Roche, who supervises the production of more than 400,000 broilers at a time in Massachusetts and Connecticut, believes that the key to cutting broiler cost lies in raising birds quicker to cut down on what he calls "boarding time." In other words, if birds can be raised one week quicker, 60 to 70 per cent of the feed which goes for body maintenance during the last week will be saved. New management programs are designed to speed growth and thus get the birds to market at the same weight but about a week sooner.

Raise Birds in Small Pens

One of the basic changes which has been made is the use of small

Reprinted by permission from Poultry Tribune, Mount Morris, Illinois

pens. For several years, poultrymen have been keeping an eye on results obtained in the Maine broiler test. Here, birds are raised in small units and growth rates have been exceedingly good.

About the only difference that can be noted between growing practices there and those in commercial operations was the use of small pens. In an attempt to duplicate the Main broiler test results, many growers have resorted to smaller pens.

For some time, New England broilermen have been supplying one square foot of floor space per bird. They have continued this practice, except for an increase to about one and one-fourth square feet during the summer. So, floor space has remained about the same, but houses are broken up into pens holding anywhere from 400 to 2,000 birds.

Wire Frames Separate Pens

Most houses can be divided into one row of pens. In extremely wide houses, it is best to have two rows of pens which are approximately square, rather than one row of long, narrow pens. Partitions between the pens are generally made of four-foot-high frames covered with one-inch poultry netting. Frames are generally made so they can be removed when the house is cleaned out.

Just why broilers do better in small pens hasn't been fully determined. A number of theories have been suggested.

One theory is that in small pens there is less competition between birds. Broilers in smaller units know each other better and get their "peck order" well set, so that fighting is reduced.

Another theory is that birds cannot pile up in large groups when they are in small pens. Oftentimes, a large bird will fill his crop and then sit down. As others also eat and then go to rest, they settle around this bird. Soon there is a large pack of broilers. When the birds in the center again become hungry, it isn't easy for them to get out of the pile to get back to the feed troughs. With small pens, groups are much smaller so that birds can make their way back to the feeder more readily.

Feed Waste Gets Attention

Methods to reduce feed waste are also receiving considerable attention. A combination of practices is being tried.

Poultrymen have noted that when birds eat feed in crumble or pellet form, they seem to waste less. Particles are large and they are not billed out of the feeders as readily. If they are, they are large enough to be picked up.

Since they have been getting good results on a 5/32 inch pellet

for birds four weeks of age and older, several large broiler growing concerns are now trying a 3/32 inch pellet for starting chicks. An experiment conducted by one organization in Maine showed considerable reduction in feed waste when the small pellets were fed to chicks.

Large Saving Found

After computing the cost of feeding chicks 3/32 inch pellets versus mash during the first three weeks, they came to the conclusion that is would be possible to pay as much as $36 more for pellets because of the reduced wastage. As a result of this test, they are planning to go on an all-pellet feeding program.

Another thing which growers like about pellets is that the birds can fill their crops more readily. After eating the pellets, the birds need a great deal of water which is another encouraging sign, since high water consumption promotes rapid growth.

As a further step toward reduced feed wastage, several growers are also debeaking their chicks at day old. It has been found in several tests that debeaked chicks will waste less feed since they can't bill it out of the hoppers. For the most part, both beaks are being cut so the birds have a straight surface on the front for picking up the pellets.

When day-old chicks are debeaked and placed on pellet feeding, poultrymen find it necessary to check their birds to see that they are eating enough. If they aren't, they can supply mash until the birds learn to eat the pellets.

New Feeders Tried

Growers seem more ware of the importance of feed wastage than ever before. Different types of feeders are being given a close look. At the moment there seems to be some interest in tube feeders. Growers are reporting very low feed losses if feeders are kept adjusted constantly. These feeders are allowed at the rate of 30 per 1,000 birds.

One large concern is using 30 four foot trough-type feeders per 1,000 birds. They are five inches wide on the bottom and have four-inch sides which slant inward to give a three-inch opening, so that feed cannot be billed out. A light sprinkling of pellets is placed in these hoppers four times daily. Just enough pellets are placed in the hoppers to barely cover the bottom.

Water space requirements are also being increased. Round dome type waterers are commonly being used in conjunction with the hanging feeders. Six of these dome type waterers are being provided per 1,000 broilers. They are attached to a flexible hose so they can be moved around the

house. Generally five hanging feeders are hung in a circle around the waterer so the birds can get to them readily while eating. When long waterers are used, two eight foot troughs are provided for each 1,000 broilers.

Financing Programs Revised

Low broiler prices also have brought about changes in financing practices. In Maine, the old penny-a-week program is still being used, but it has been revised to produce more incentive for the grower to do a good job.

During the growing period, the grower receives one-half cent per week. After he sells the birds, the remainder of his money is held until average production costs for growers who sell the birds in a two or four week period can be computed. Then, if a grower's average production cost is below the average, he receives his full one-half cent plus a bonus.

If the grower's production costs are above average, he receives less than the one-half cent. This system has caused quite a bit of competition among growers since they are always interested in being in the upper half so that they might get their bonus.

What results have these practices brought? Men who deal with a great number of growers and keep records estimate that costs have been cut about two cents in the past year. Two cents can make the difference between profit and loss in broiler operation.

1954 was the 50th anniversary of the ice cream cone, and the 20th anniversary of the paper milk carton. Twenty years ago—when people had to worry about returning bottles—almost 95 per cent of all fluid milk was delivered to the home. Today, reports from cities say that 75 per cent of all milk sold is bought in stores in paper containers.

Saving Vitamin A In Alfalfa Meal

By treating alfalfa meal with a fat or oil, USDA scientists think they can cut in half the loss of vitamin A feed value in alfalfa meal. When growing green in the field, alfalfa is rich in carotene that poultry and other livestock convert into vitamin A But when the alfalfa is cut and made into dry meal, it loses as much as 50 per cent of the carotene. The carotene just combines with oxygen and disappears. Animal fats and vegetable oils, mixed in the meal absorb the carotene and hold the vitamin A value. They are readily digested. In tests, meal treated with 5 per cent animal fats retained nearly twice as much carotene as untreated meal.

TREES ARE A CROP

Minnesota has a program to help the farmer obtain maximum profits from his woodlot . .

Condensed from Extension Service Review

Harry R. Johnson

"YOU wouldn't sell a hog on the basis of what you guess he weighed! You'd weigh him and sell him by the pound, after knowing the going market price. And that's the way to sell your timber." The farmer nodded his head in agreement with the county agent.

Many farmers are not experienced in judging the value and use of their timber. For this reason, the Minnesota Extension forestry program was begun 8 years ago.

It has been so successful that four foresters have been hired to assist county agents. Their job is to help these farmers, who depend on farm woodlots for much of their income, to grow timber as a crop. This includes growing the right tree species on the proper soil type, doing the right kind of thinning, improvement cutting, and other cultural practices to assure healthy growth, harvesting trees at the right time and size for many markets, and using labor more efficiently in harvesting the farm forest.

When one of the new Extension forestry agents calls at a farm, he has two useful tools to give a tree farmer. The first is a composite board-foot volume table. It helps the farmer measure board-foot content of standing timber.

The second is a simple sliding log scale that shows him the amount of board-feet in various size logs. This handy little gadget helps him measure and cut with less waste according to his actual home or marketing needs.

Operators in the 1,300 sawmills in Minnesota also get help. There is a tremendous waste of lumber because of inefficient sawing. This means a loss to the farmer, who is a mill custo-

Reprinted from Extension Service Review, Chicago, Illinois

mer, and a loss to the sawyer.

The program's total possible effect on northern Minnesota's agricultural economy is tremendous. It will raise the living standard of the 16 timber-growing counties and attract wood-using industries who draw upon the farmers' growing and processing skills.

With over 4,000 more uses for wood and forest products than there were in 1926, the timber farmer finds it profitable to learn to know his trees and their market possibilities. Timber prices fluctuate only slightly.

If you would like a log and lumber scale described above, drop a note to Farmer's Digest. We will send one with our compliments.

Wages Are Up But Animal Workload Not Cut Much

How much labor in a livestock dollar?

Agricultural engineers say economy-minded farmers had better take a good look at labor methods in livestock production as a result of some new figures from a U. S. Department of Agriculture study.

Since the start of World War II, farm wages have quadrupled. But labor needs for livestock production were cut only 7% during the period, while crop labor needs were cut 34%. Livestock now takes 40% of all farm labor.

It takes almost as much labor nowadays as it did 50 years ago to keep sideline livestock—a cow, few chickens, and a few pigs. Progress has bypassed this phase of farming.

The study showed that among livestock, the big labor user is the milk cow. It takes an average of 61.7 man-hours to produce $100 worth of milk. That covers only labor directly applied to livestock, such as feeding, milking, hauling feed, cleaning barns and pens, and moving and disposing of the animals and their products.

Here are some of the other man-hour requirements per $100 of product; 45 man-hours for laying and replacement chickens; only 11.9 man-hours for the more centralized and mechanized broiler production; 26.8 man-hours for sheep; 23.8 man-hours for turkeys; 15.9 man-hours for hogs; and 15.8 man-hours for beef cattle.

Dairying also heads the list in labor required per animal per year. It takes 140 man-hours for a hand-milked cow, but 20% less — 111 hours — where cows are

machine milked. Feed and litter carriers, barn cleaners, stanchion drinking cups, efficient barn arrangement, pipeline and bulk handling of milk, sale of cream instead of whole milk, and maintenance of large herds and high-producing cows all made for less work per unit of product.

In hog production, size of herd makes the big difference in labor needed. That's because a large herd can use self-feeders, self-waterers, and good pastures economically, while small herds can't. So the labor input ranges from 14 man-hours per $100 of pork products in the North Central states, where herds are largest, to about 25 hours in the South.

Sheep herded on open range take quite a bit of labor, but those that are grazed on fenced pasture or range — even small farm flocks—take less than the average amount.

Labor-saving, cost-saving, equipment and management practices begin to be economical with a 200-bird flock, are even more so as flock size increases. Production-line broiler raising usually takes 5 to 15 hours of labor per 100 birds, while the less-routinized raising of chickens to the same age for laying flocks (including culls slaughtered) takes 25 to 35 hours. Similarly, in turkey production the starting point for labor saving through equipment, work methods, and management is about 100 turkeys per flock. In the last 20 years, average flock size, rose tenfold and labor input per 100 pounds declined 71%.

VPI Agricultural Newsletter

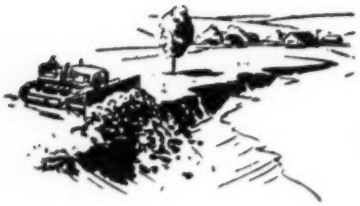
More Choice on Poisons For Rodents

You will soon have a wider choice of poisons to make good rats out of those pests around your stored grain. The newest one is a sugar bait that dissolves in water. It's called Pivalyn—in the same family as Warfarin.

Michigan State College zoologists explain that these poisons, which seem the most effective, kill rats by causing them to bleed internally. The reason they're especially effective is that large number of rats die without the rest getting suspicious.

The sugared bait, Pivalyn, takes advantage of the fact that rats need more water than food. And around grain bins there usually is no water and the pests will visit the water bait regularly. And if the weather is freezing, you can prepare the bait with grain.

Michigan Agricultural Service



Will Stubble Mulch Stop Erosion?

Here are the latest answers to the trashy fallow questions . . .

Condensed from Farm Management

IS trashy fallow farming here to stay?

Yes, say soil management technicians, and their approval of this tillage practice is being shared by more and more farmers every day.

The reason for the growing farmer enthusiasm is simple. The three chief objections to the practice by farmers have been pretty well removed.

Grain growers welcomed the idea when it was first suggested in the '30s because it promised to stop wind and water erosion which already threatened their very existence in some of the shallow soil areas of the West.

It was most successful where wind erosion was the major hazard, and in such areas is now almost universally practiced. But the price farmers had to pay for using stubble against water erosion often seemed too high.

Stubble mulching, as it was called by the soils men, was hard to handle in any area, and it was almost impossible to work in the high yield belts. Heavy trash fouled up tools, particularly the rod weeders which were needed to control moisture-robbing weeds in summer fallow.

The trashy mulch on top of the ground made it almost impossible to get a good even stand with the drills that worked so well in clean, black fallow.

And, worst of all, bacteria active in the decay of the stubble had to have nitrogen, so they took it from the soil and yields in stubble mulched fields were disappointingly lower.

Today, agricultural engineers and farmers have designed tools to handle the stubble mulch, and seeding equipment to seed it. Nitrogen supplements have solved the yield problem on a money-making basis, and chemicals have solved some of the weed control problems in stubble mulching.

A recent survey revealed that many farmers did not have up-to-date answers to their stubble

Reprinted by permission from Farm Management, Union Stock Yards, Los Angeles, California

mulch questions.

Here, then, are the latest answers to your questions provided by two leading stubble mulch authorities, Merle Oveson, superintendent of the Pendleton branch experiment station, speaking for the Northwest, and Lloyd Brown, associate agriculturist in soil conservation, reporting for the Southwest.

Q. What is stubble mulching?

A. Stubble mulch, or trashy summer fallow, is a system of farming in which all of the straw residue from the preceding grain crop is left on the surface of the soil for control of erosion by wind and water. Wind erosion may occur in light soil anywhere, but slopes must incline from 2% to 3% to suffer water erosion.

Q. Why is it recommended?

A. By using stubble mulch in lighter land, wind erosion can be almost completely controlled. In higher rainfall areas where water movement is the primary cause of erosion, lighter amounts of mulch on the surface may not completely control erosion although it will assist greatly. In such areas, it may be necessary to supplement stubble mulching with cross slope tillage and seeding, or with strip cropping, or by putting in diversion terraces to lead excess water off the field so that the land is not damaged.

Q. What tillage methods have given best results?

A. The ideal answer to this question varies with the district, the amount of rainfall, the steepness of slope, the type of soil, the weed problem, and the variety of wheat grown.

For the Pacific Northwest, in general, the following plan is recommended: Start with the combine at its normal level of cut and use a spreading attachment to scatter the straw. In some heavy straw areas, growers follow the combine with a rotary beater type of stubble buster or actually mow the stubble, some using a standard mower and others the bottom of the combine header.

Where the straw stand is not excessively heavy, the stubble can be handled readily without mowing by one of the several sweep plows on the market. These include the Cheney, the Calkins, and the Noble. Widely used tools with somewhat less clearance include the Graham-Hoeme plow, and John Deere's and International's standard tool-carrying equipment with sweeps attached. Generally, sweeps do a far better job than disc plows.

One of the most valuable new tools is the Dunham skew treader. Basically an offset rotary hoe, this tool breaks up stubble and spreads it evenly over the surface, and is useful under a variety of conditions.

According to Merle Oveson,

where there are two or more tons of straw per acre, the rod weeder does not clear readily following the sweep plow. Under these conditions, the skew treader will eliminate this difficulty. Also, many farmers have found the new Calkins center-drive rod wheeler a valuable tool in working a heavy mulch.

Following the sweeps or the skew treader, if it is used, rod weeders are employed. Chemical weed control and nitrogen fertilizer make it possible to keep the number of mechanical weedings to the bare minimum, a highly desirable practice.

Cheat grass, common over much of the Northwest wheat area, presents a serious problem in stubble mulch. Timing appears to be critical. If the sweep is used before roots are well developed, the plant may simply ride over the blade. But delay may allow the cheat to form seed. Well timed sweeping in combination with the skew treader has given good control.

In the wheat areas of the Southwest, principally California, several systems are used. In Northern California stubble is plowed with a modified moldboard or worked with a chisel in the spring. Light disking or rod weeding control summer weeds and grain is planted in the fall. In the Sacramento and San Joaquin valleys the disk is replacing the moldboard plow.

In the central coastal counties where yields dropped when stubble was first disked in the spring following the previous crop year, disking in the fall of the crop year, immediately after the first rain, followed by a second disking in March and summer weed control with a rod weeder, have prevented erosion and kept yields up.

Q. How have seeding problems been solved?

A. In the lighter straw areas seeding has presented few problems. With considerable mulch on the ground, it is impossible to do a satisfactory job of seeding with just any kind of drill. Where the straw is not too heavy, a semi-deep furrow drill with 10-inch spacing will do a good job. A new drill opener manufactured by the Bielke Drill Shoe Co. of Pendleton, Ore., gives good stands in moderate amounts of stubble mulch.

Standby drills which have been used to the greatest extent in trashy summer fallow are deep furrow drills with 14-inch spacing. Those tried with good results at the Pendleton station are John Deere, Dempster, and International. Oveson reports all three do a good job in heavier amounts of stubble mulch.

Satisfactory stands are also reported with double-disk drills and semi-deep and deep furrow

drills where the skew treader has been used in the summer fallow operation.

Q. What happens to yields?

A. Wherever stubble mulching has been practiced, yields do drop with the trashy fallow. In California early fall disking seems to have brought yields back to normal where it has been tried.

In the heavier mulch areas, there is more available nitrogen in black summer fallow than in trashy fallow due to the amount of nitrogen tied up to decompose the straw and because the temperature is consistently lower under the mulch and there is less nitrification in the soil. Yields are from two to six bushels per acre lower in stubble mulch, except where nitrogen is added to make the wheat use the moisture saved under the stubble mulch more efficiently.

Q. What is the effect of added nitrogen?

A. In general, 20 to 30 pounds of added nitrogen more than make up the loss caused by stubble mulch compared to moldboard plowing. The increased yield more than offsets the cost of the nitrogen and its application. Increased amounts of nitrogen increase yields correspondingly with a 40 to 60-pound rate proving the most economical. No doubt similar applications to black fallow would increase yields correspondingly, but the important fact is that a grower can maintain his yields and still save his soil when nitrogen is added to trashy fallow.

Q. How do tillage costs compare?

A. Initial cost of stubble mulching equipment is higher as a rule, and some operations under stubble mulching may be slower, but the smaller number of follow-up operations with stubble mulch offsets these black fallow advantages in the long run.

Q. Does wheat variety make any difference?

A. Brittle straw is a help. Some varieties, notably Elmar, are easier to handle from this standpoint than Rex and the turkey varieties. Tall straw means more trash to handle, often without any real gain in erosion control. New semi-dwarf varieties under test may be helpful for early fall seeding.

In rotations involving peas or sweetclover, there are special problems, some not yet satisfactorily solved. Handling sweetclover as a mulch is getting attention. Rough plowing after peas is an excellent practice on heavier soils. Experience with new tillage tools promises help.

In general, these problems are being approached on the theory that a high level or organic matter is of greatest value where conditions make it difficult to give surface protection.

Feeding Silage to Sows

How good a feed is grass and corn silage for brood sows? Research by animal husbandrymen at Purdue University has been aimed at finding the answer.

Experiments with a group of 40 sows at the agricultural experiment station were conducted to determine: 1st, to what extent grass and corn silage can be used in a gestation ration; 2nd, what nutrients need to be added to silage to make it a good gestation ration; and 3rd, to compare the results of feeding grass and corn silage.

J. H. Conrad and W. M. Beeson, who conducted the experiments, found that feed costs during gestation—on a per pig weaned basis—were reduced 28 per cent by feeding grass or corn silage with proper supplements. Ground corn and minerals alone are not a satisfactory supplement for grass silage, the tests showed. In order to correct the deficiencies of corn silage, a high quality mixed protein supplement was found necessary.

Forty sows used in the experiments were divided into groups of ten. The first group was fed seven pounds of a good gestation ration daily; the second, grass-legume silage plus two pounds of ground corn; the third, grass-legume silage plus one pound corn and one pound supplement; and the final lot of ten sows, corn silage plus two pounds of silage.

For the four groups respectively, the average gain per sow during gestation was 121, 31, 50 and 55 pounds, but feed cost per 100 pounds of gain were higher for the silage-fed sows. Sows fed silage, however, showed considerably lower feed costs per pig farrowed and per pig weaned, than did those fed a normal ration.

Best results were obtained with those fed a corn silage plus two pounds of well balanced protein supplement daily. With this ration, costs per pig weaned were reduced by 80 cents per head. Although results of these tests show promise, the research men state that more experimental work is needed before this method of gestation feeding can be generally recommended.

Purdue University

When only two-thirds of a cow's protein requirement is fed, a 64 per cent calf crop results. But, when enough protein is fed to meet the cow's regular requirements, a 93 per cent calf crop is usually secured.

More Milk From More Feed That Costs Less

Facts and figures provide latest information for producing milk at a profit . . .

Condensed from Guernsey Breeder's Journal

George Hyatt, Jr. N. Carolina Extension Specialist

THE cost of feed used in producing 100 pounds of milk can be reduced as much as 25 per cent on the average dairy farm in many sections of the country, and by as much as 40 per cent in most states in southeastern United States.

Using North Carolina dairymen as an example, the record shows that in 1953 they fed 39 pounds of concentrate for each 100 pounds of milk produced, which is one pound of grain per 2.5 pounds of milk. The average for the United States was 30.7 pounds per 100, or a grain milk ratio of about 1 to 3.3. The problem of making more milk with less grain is still a big one.

More Milk From Roughages

How can dairymen get a greater portion of their milk from roughages? This can be accomplished, first, by improving the quality of the roughage; and then feeding more roughage and less protein and grain.

A study by Hoglund at Michigan State College of the roughage production and feeding practices on 34 southern Michigan dairy farms showed a wide range in both the quality of roughage produced and the cost of producing milk. Producing 100 pounds of milk cost those farmers who harvested and fed roughage of excellent quality 46 cents less than it did those who used poor quality roughage. Returns above feed costs were $65 per cow in favor of the excellent quality roughage.

Part of the load of producing milk must be shifted to roughage from grain. This shift must be made without sacrificing any appreciable amount of production. This shift cannot be made on an economical basis if high quality pasture, hay, and silage is not available. *If the roughage is not available the cows cannot eat it, and if it is not of good quality*

Reprinted by permission from Guernsey Breeder's Journal, Peterborough, N. H.

they will not consume enough.

If the roughage is made available, *then less concentrates must be fed.* Feeding concentrates reduces the amount of roughage a cow will eat. Thus we cannot expect roughage to support the desired share of production if we continue our high average level of grain feeding per pound of milk.

The best available estimates indicate that for each pound of concentrate fed, hay consumption is reduced by ½ to ¼ of a pound. Of course, concentrates have a higher energy value than roughages, and a pound of concentrates will support more milk production than a pound of hay. However, by increasing roughage quality we can increase the amount of roughage which a cow will eat, and it is possible to reduce considerably the average amounts of concentrates fed our cows without loss of production or to increase production without increasing concentrates.

It has been observed (by Waugh and associates) at North Carolina State College that some cows will eat daily as much as 3.5 pounds of high quality alfalfa hay per 100 pounds of body weight. This would amount to 42 pounds for a 1,200-pound cow. A few cows have consumed even more. A pasture experiment at Purdue University recorded intakes of high quality pasture as high as 225 pounds a day.

An extensive experiment at the New Jersey station showed that cows would produce 95 per cent as much milk when fed high quality alfalfa, corn silage, and grain at a rate of 1 pound for each 6 pounds of milk as when fed the same feeds and grain at a rate of 1 to 3.

Table 1 is a summary of the new Jersey experiment.

These observations were made when really good roughage was fed free choice, and they definitely indicate the possibilities of shifting a greater portion of the production load from concentrates to roughage.

North Carolina Dairymen on the average feed about 1 pound of grain for each 2.5 pounds of milk produced. A study by Barr and associates at Penn State University show about the same results and in addition pointed out *that some are feeding one pound of grain for each pound of milk.* Others are much more efficient. The same is true in North Carolina and probably most other states.

Let's suppose that a dairyman with a good supply of quality roughage were to shift from 2½ to 4½ pounds of milk per pound of grain fed. What would be his savings and what changes in his feeding program would he have to make? Let's begin by assuming that this shift was made with

an 8,000-pound cow. In the one instance approximately 3,200 pounds of grain would be fed per cow, at the lower rate about 1,775 pounds of grain would be fed per cow, or a saving of over 1,400 pounds per cow per year. If this 1,400 pounds of extra grain were purchased at $3.50 per hundredweight, this would represent an expenditure of $49 per cow, or on a 30-cow dairy a total of $1,470.

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to Cow's Needs

In a program where more milk comes from roughage and less from grain, it is very important that the grain be given to those cows that need it the most. This is where many dairymen fall down, for only about five per cent of all the dairy cows in the United States are on DHIA test.

It is an established fact that for cows to milk best they must be fed according to their need. With so few cows on test it is obvious that the major portion of the cows in the United States are not fed according to production. When accurate milk weights and butterfat tests are not known for individual cows in a herd, the tendency is to underfeed grain to the good cows and overfeed those producing only a small or moderate amount of milk. Let's

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If records of production were not available in this herd, my observations have been that usually the 15-pound cow would get 6-10 pounds of grain daily, while the 30-pound cow would receive 10-12 and the 50-pound cow 12-14. This would add up to at least 30 pounds of total grain and probably nearer 35 pounds. Just as much or more grain

they will not consume enough.

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Table 1 is a summary of the new Jersey experiment.

How Much Is Farmer's Digest Worth?

"I enjoy Farmer's Digest and find it so valuable that I would like you to quote me a price on all issues since 1945. I will bind them and have a complete library for reading and reference."

* * *

"One article in Farmer's Digest made me at least a thousand dollars. I can say your magazine is the best investment I ever made."

* * *

"Had I subscribed to your magazine years ago, farming for me would have been much more profitable. I won't be without it again."

The same is true in North Carolina and probably most other states.

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an 8,000-pound cow. In the one instance approximately 3,200 pounds of grain would be fed per cow, at the lower rate about 1,775 pounds of grain would be fed per cow, or a saving of over 1,400 pounds per cow per year. If this 1,400 pounds of extra grain were purchased at $3.50 per hundredweight, this would represent an expenditure of $49 per cow, or on a 30-cow dairy a total of $1,470.

If the ratio of grain fed to milk produced could be widened to 1-6, which is well within the realm of possibility, the savings in grain fed per cow would be over 1,800 pounds per cow per year, or on a 30-cow herd $1,890. These possible savings are gross amounts. There would have to be additional roughage available to replace the total digestible nutrients in the 1,400 or 1,800 pounds of grain. The cheapest and most desirable source of these nutrients is high quality, home-grown roughage.

Feed Grain According to Cow's Needs

In a program where more milk comes from roughage and less from grain, it is very important that the grain be given to those cows that need it the most. This is where many dairymen fall down, for only about five per cent of all the dairy cows in the United States are on DHIA test.

It is an established fact that for cows to milk best they must be fed according to their need. With so few cows on test it is obvious that the major portion of the cows in the United States are not fed according to production. When accurate milk weights and butterfat tests are not known for individual cows in a herd, the tendency is to underfeed grain to the good cows and overfeed those producing only a small or moderate amount of milk. Let's look at an example or two to point up what this means. Suppose there were three cows in a herd, one producing 15 pounds, one 30 pounds and the other 50 pounds of 4 per cent milk daily. According to "Feeds and Feeding," by F. B. Morrison, the 30-pound producer would require 9.3 pounds of grain daily, while 50-pound cow would require 18 pounds, or double the other cow. The 15-pound producer would only require 3.0 pounds of grain daily. The total daily grain requirements for these three cows would then be approximately 30 pounds.

If records of production were not available in this herd, my observations have been that usually the 15-pound cow would get 6-10 pounds of grain daily, while the 30-pound cow would receive 10-12 and the 50-pound cow 12-14. This would add up to at least 30 pounds of total grain and probably nearer 35 pounds. Just as much or more grain

would be fed but it wouldn't be distributed so as to result in the greatest production per cow.

The majority of dairymen must be sold that grain feeding according to production is essential and economical. Some system of record keeping must be maintained in order to do this job right. It is not necessary that every dairyman be on some type of official or DHIA test, however, it is important that the weight and test of the milk from each cow be checked once a month at least in order to have some guide for use in determining the grain needs of individual cows. I don't care how good a dairyman thinks he is, he's not smart enough to guess at the production of his cows and come out with the right answer very often. This point has been preached and repreached to dairymen for years, but still only a small percentage put this important practice into every day operation.

If dairymen are going to switch to a program where more milk comes from roughage and less from grain, they not only have got to feed the grain strictly according to production but they must make sure the grain they are feeding is of high quality.

The dairyman who raises his own home-grown grains hasn't much of a problem. All he need purchase is a protein supplement and minerals, mix them together with his home-grown grains in the right proportions, and he has a very suitable grain supplement. On the other hand, a great many dairymen, especially in the Northeast and Southeast, don't raise any grain at all. They have several alternative methods of purchasing grain for their herds. (1) They may contract for grain in the field raised in another part of the state or even in another state. A number of North Carolina dairymen contract for the purchase of grain grown in another state and truck it in. These grains, with a protein supplement and minerals added, serve as the grain mixture. (2) Some dairymen purchase the basic grains, such as oats, corn, barley, etc., from their local feed dealer and have him add the protein supplement and minerals and mix in the correct proportions. (3) A large proportion of the dairymen not growing home-grown grains simply order a mixed feed from their feed dealer. It may be a 12, 16, 18, or 20 per cent protein dairy feed.

Many just decide whether they want a 12, 16, 18, or 20 per cent protein feed, then inquire about the price of it per hundred or ton and go ahead and buy. This costs dearly through smaller milk checks. The first step is to read the tag that appears on the feed bag in most states, and if not a tag read what is printed on the

bag. In North Carolina the following information is found on the tag accompanying each 100-pound bag of mixed dairy feed.

First, the weight of the feed. This information is important, but too often this is the only measure used in buying feed in the bag. The economy package by weight does not necessarily mean economy in milk production.

Second, the label gives the manufacturer's identification of the feed. The buyer should be interested in the specific purpose for which the feed is to be used such as for growth, milk production, etc., as well as in the general grades of the feed. The manufacturer often has several trade brands, which indicate different grades that vary in price. Thus, the dairyman should ask: "Is this grade the most satisfactory for the purpose for which the feed is being purchased?"

Third, the label tells who prepared the feed in the bag.

Fourth, the list of ingredients in the bag is of interest primarily in mixtures, such as formula feeds. This information may be revealing when the number of ingredients is few, or misleading when the number is great. Variety has some merit in dairy feeds, *but it does not mean the greater the number of ingredients, the better the feed.* The relative amount of each constituent, which is not shown in the closed formula system is the important factor. When looking over the ingredients, ask whether or not they are all necessary feeds for dairy cattle.

Fifth, the guarantee of purity gives assurance of what is there, but does not reveal the quality of the ingredients. This is of major importance in dairy feeds, and is to be considered in palatability. Today, manufacturers are emphasizing quality control in formulating feeds.

Sixth, the chemical composition, which is a good index to the nutritive value of feeds *when recognized ingredients of high quality are used.* The feed analyses show what is in the feed, but do not indicate how much the cow is able to get from it. If

TABLE I

Milk Production Obtained at the New Jersey Experiment Station With Good Roughage When Concentrates Were Fed at 3 Levels

	Levels of Concentrate Fed	Lbs. Milk Per Cow	Group III % of
Group I	Roughage-no concentrate	8,410	81.6
Group II	Roughage-concentrate, 1-6	9,741	95.0
Group III	Roughage-concentrate, 1-3	10,313	100.0

ingredients that have been tested by actual feeding trials are used, the chemical content is considered a good guide to what is in the bag.

What Does the Analysis Mean?

Among the nutrients considered, a *minimum* percentage of crude protein, crude fat and nitrogen-free extract is guaranteed; whereas, the *maximum* percentage of crude fiber is given. The crude protein, crude fat, and nitrogen-free extract are the more desirable. A good feed will contain more of these nutrients and less crude fiber. However, the chemical analysis does not give the complete value of the feed.

Crude protein is an expensive and essential part of dairy diets. The high protein ingredients most commonly used are oil meals. Thus, if the dairyman is interested in purchasing protein to supplement other feeds, he should consider the cost per pound of protein in the bag rather than the cost per pound of the feedstuff. In some feeds on the market today, part of the crude protein comes from a special supplement, urea, which is not a protein but provides some of the raw material from which the cow herself can manufacture needed protein. If urea is in the feed, the label will be as follows: "Crude protein, not less than .. per cent. (This includes not more than 25 per cent equivalent crude protein from non-protein nitrogen.)"

Crude fat is a concentrated source of energy. One pound contains about 2¼ times more energy than either proteins or carbohydrates. Grain rations for producing dairy cows should have at least 2½ per cent crude fat. Amounts as high as four per cent are preferable, if cost does not increase too much.

Nitrogen-free extract is the chemical fraction that includes the more digestible carbohydrates of the feed. Therefore, a guaranteed minimum requirement is desirable.

Crude fiber, which also is a carbohydrate, but poorly digested, is the less desirable class of chemical nutrients. Too much of this item may interfere with the utilization of other nutrients. This is often referred to as "filler" and to protect the purchaser only a certain percentage is permitted.

TO SUM IT UP, decide what per cent protein is needed in the mixture according to the kind of roughage available; then within that protein group choose a feed that is high in usable carbohydrates (nitrogen-free extract 50 per cent or more), low in crude fibre (12 per cent or below) and with at least three per cent crude fat. This should give a feed that is high in digestible nutrients.

DEVELOPMENT OF THE SENEPOL

A new dual purpose breed of cattle has been developed at St. Croix in the Virgin Islands . . .

Condensed from The Cattleman

Dr. C. Gaztambide Arrillaga, Extension Dairyman, Puerto Rico

MOST improved breeds of cattle, either for beef or milk, were developed in Europe. More recently, the Santa Gertrudis breed of beef cattle has been developed in the United States of America. Another breed, developed in the United States, is the Senepol. This dual purpose breed came from Island of St. Croix, in the Virgin Islands. The man responsible for preserving and increasing the promising stock is a leader in the American automotive industry, Ward M. Canaday, of Toledo, Ohio.

Sometime in the year 1860, a Mr. Elliot, owner of Estate Longford, near Christiansted, St. Croix, imported 60 heifers and two bulls from Senegal in western Africa. These animals, because of their origin, have been known locally as Senegalese cattle. Animals of a similar type and origin are called Senegalese cattle in Puerto Rico. The original foundation animals were from the tropical belt of Africa and carried the heat tolerance of animals which, due to the environment in which they have been bred for generations, have the constitutional m a k e - u p and the physiological characteristics which give adaptability to the tropics. The original animals were large and husky, maybe a bit rough, but of a gentle temperament. The color was reddish yellow with horns.

A Mr. Nelthropp, a former owner of Estate Granard, purchased from Elliot some of the offspring and continued to multiply the Senegalese cattle which showed so much adaptability to Virgin Islands conditions.

Around the year 1889, when Bromley Nelthropp was manager of Estate Granard, there were about 250 head of purebred Senegal cattle there.

Nelthropp inherited a large number of Senegal cows and heifers which he continued to keep pure and multiply. From these originated the animals that laid the foundation for the cattle

Reprinted by permission from The Cattleman, Fort Worth, Texas

previously called "Nelthropp Cattle" which are called Senepol today.

Bromley Nelthropp made frequent visits to Trinidad. At the Agricultural Experiment Station of Trinidad he saw Red Poll cattle imported from England by the government for breeding purposes. This breed seemed to adapt well to conditions in the Caribbean area. As a result, in the year 1918 he purchased in Trinidad a purebred Red Poll bull named "Douglas" which had been imported from England. He mated this bull with his Senegal cows and kept him for eight years. When the bull was already getting old, he selected two outstanding sons of Douglas to use on his best type cows. He used these two bulls in his herd until 1942. This herd functioned as a closed herd, no other foreign blood has been added since the beginning. Douglas' sons were used largely on the original foundation cows and to some extent on the first generation females.

In the year 1942 Nelthropp bought from Estate Tutu on Saint Thomas, a second purebred Red Poll named "Doctor" and two purebred cows of a red gold color. Then he closed the herd again to foreign blood.

As time passed and livestock men in the Virgin Islands saw the good uniform characteristics of the cattle bred by Nelthropp, they started to buy bulls and a few heifers for breeding purposes. As a result a number of leading farmers raised cattle similar in breeding. To increase the number and quality of his herd, Nelthropp brought the best of these into his herd. During the thirties he purchased several polled heifers from Carl Lawaetz, owner of Little La Grange Estate. Lawaetz had been crossing Nelthropp bulls on Senegal cows for a long time.

It is interesting to know that the type, color and polled condition of the Red Poll seemed to be dominant and blended nicely with the characteristics of the Senegal.

In the year 1949, Ward M. Canaday of Annaly Estate purchased the entire herd from Nelthropp, who, being elderly, was now retiring. The herd consisted of 132 animals. Today it numbers more than 300 head.

Since then Canaday has been breeding Senepols with great success. He has kept the cattle pure by preventing the introduction of foreign blood.

Senepol cattle are of medium size. Their color is generally cherry red with some variations in shade. They are naturally polled. White spots in the forehead and tail are objectionable but do not disqualify.

They are hardy animals re-

sistant to pasture shortage. They are good rustlers and easy feeders. Senepol steers put on weight easily and fatten to heavy weights.

> Studies show dairy cows graze heaviest immediately after morning and night milkings. Virginia researchers say that means the night pasture for cows is just as important as the day pasture. Beef steers grazed heaviest from 4 to 8 a.m. and from 6 to 8 p.m., during the July-September tests.

Senepol cows are good milk producers. They can carry a calf for the normal period and at the same time produce abundant milk. Their disposition and temperament is gentle and they are not easily disturbed.

Senepol cattle are sure breeders and they multiply rapidly. At present there is a large number of them on St. Croix and neighboring islands. They have been spreading rapidly and the demand for them is great. The British Islands in the Caribbean have bought a large number of Senepol bulls for breeding purposes.

It is expected that Senepol cattle will continue to spread throughout the Caribbean in view of the great acceptance and large demand for them.

At present a number of studies and trials are being conducted in furtherance of this promising tropical breed.

Since the purchase of the herd by Annaly Estate a complete registry is being kept of the breed.

Larger Flocks . . . Greater Efficiency

Egg producers who seek efficiency in the laying house are advised to have flocks of 1,000 or more hens.

"Efficiency increases with flock size," says Ben Wormeli, poultry husbandman. "There is a definite need for increasing flock numbers to more economical units — to at least 1,000 layers."

Stay in business in both good and bad years, he advises. Only increased commercial production and fewer backyard producers will stabilize the fluctuating egg market.

When eggs make favorable returns one year, there is a tendency for backyard producers to jump into business the next. Although there is only a slight upsurge in production, it is enough to put prices on the skids, Wormeli explains.

Texas A. & M. College

TURKEY HATCHING EGGS THE YEAR 'ROUND

Solving an old problem, growers claim a million dollar secret as a result of research at Oregon State College . . .

Condensed from Turkey World

Prof. J. A. Harper, Oregon State College

TURKEY breeding flock owners are showing increased interest in the possibilities of producing hatching eggs the year 'round.

Such a program, particularly with varieties or strains that are being used for fryer production, offers a chance of utilizing equipment, labor, and capital to the best advantage. Even for rearing of mature market birds, there could be advantages in areas of mild weather to continuous year 'round production.

The experiences of breeding flock owners in attempting to obtain good egg production, particularly during the summer months, has not in all instances proved satisfactory. With breeder turkeys hatched in November or December, egg production in June, July, August, and September seldom reaches above 25 to 30 per cent.

Light Plays Important Role

While the factor, or factors, responsible for the low rate of production during summer months is not definitely known, evidence available through recent experiments with turkeys and other species of birds indicate that light plays an important role.

The effectiveness of artificial light to stimulate turkey hens to lay earlier during winter short-day lengths was shown by the Nebraska Agricultural Experiment Station as early as 1930. Since that time, it has become a common practice to obtain fall and winter egg production by increasing the daily light period on flocks grown *during a period of decreasing day length* (spring-hatched turkeys). According to the California Station, a 13 to 15-hour total light period appears to be about optimum for such turkeys.

In turkey flocks *hatched during the winter months,* a different situation exists, in that the

Reprinted by permission from Turkey World, Mt. Morris, Illinois

birds are maturing *during a period of increasing day length.* In other species of small birds, researchers have found that following the exposure to long day lengths, there is a period in which further increases in daily light do not stimulate reproductive organ development. *In order to end this period, exposure to a short daily light period is necessary.*

The effect of reducing the daily light period on turkeys or chickens nearing sexual maturity, with subsequent exposure to a longer day length, has received little attention. In 1953, at the Oregon Station, a preliminary test of this possibility for increasing summer egg production of Beltsville White turkeys was carried out.

A group of 50 range-reared turkey hens hatched February 18, 1953, were divided equally among five pens when 23 weeks of age on August 1. The light exposure treatments were as follows: (1) ten hens were placed in an outside yard with a shelter equipped to provide artificial light (2) the 40 remaining hens were moved to a pole breeder house with wire sides, and 10 hens per pen each were restricted to nine hours of light per day for 6, 7, 14, and 21 days respectively. The hens then were provided with a 17-hour day length beginning August 7 for the first three pens. On August 14 and 21 respectively, the two and three-week restricted daily light pens were put on 17-hour day lengths also.

From September 1 to November 20, egg production of the non-light restricted range and confined lots averaged 28.6 and 26.3 per cent.

The lots restricted for one, two and three weeks on a nine-hour day length averaged 29.4, 40.1, and 48.4 per cent production respectively.

Individual hen trapnest records, plus examination by everting the oviduct, showed that in each of the pens in which light was not restricted, only five hens produced eggs.

Restrict Light For 21 Days

These data, while limited tend to support the supposition that hens reared during periods of long day length become non-responsive to increased daily light. *The optimum time from the above data appears to be at least three weeks on a restricted nine-hour daily light period, followed by exposure to a longer day length.*

It should be emphasized that the above information is limited and needs further experimental checking before definite recommendations can be made. During the ensuing year, additional experiments are to be conducted at Oregon Agricultural Experi-

ment Station, supported in part by a grant from the National Turkey Federation.

In practical application for commercial flocks, housing of some sort would be needed where hens nearing maturity could be confined without light. In the experiment described above, the hens were driven into the darkened pens at five o'clock in the evening where they were confined until eight o'clock in the morning. During the day, they were exposed to natural light, with feed and water available only during that part of the day.

If total confinement were to be practiced in pens or a house darkened for the purpose of restricting light, the use of artificial lights with a time clock to control daily light periods could be used.

An additional consideration in such a program includes the observation that hens already in lay when the light period is restricted to nine hours a day will cease production and molt.

Males to be used for mating with the hens should be maintained under natural light.

The time for hens to reach 50 per cent lay requires about four weeks following exposure to a longer day length. A wide range in time of onset of egg production occurs when turkeys hatched in the winter months reach sexual maturity under increases in natural day length. Though restricting the hens to a short day length prior to sexual maturity, they will come into production more uniformly.

Concrete Stronger When Dried Slowly

To make sure your newly poured concrete sets properly, don't let it dry out too fast, cautions A. H. Schulz, North Dakota farm engineer.

After the concrete reaches its initial set, he suggests wetting it down, the wetter, the better. When concrete was kept wetted down for 28 days, it tested nearly twice as strong as concrete that dried out fast. The water is needed for the chemical reaction that gives cement its bonding strength in the concrete mixture.

Schulz also stresses a good job of skreeting the newly poured concrete. That's the operation of leveling off the mixture by running a 2 by 4 across the tops of the forms in a sawing motion. This action forces the rocks down into the mixture and brings the rich cement mix up to the top for a strong, good wearing finish.

North Dakota Extension

Reproductive Performance of Gilts

Some factors we know how to control, some we do not, in obtaining large, early litters from gilts. Recent research offers valuable suggestions for the hog breeder.

Condensed from
American Hampshire Herdsman

Dr. George L. Robertson, Texas A. and M. College

ABOUT 75% of the pigs produced in the United States are farrowed by gilts. Maximum reproductive efficiency in the gilt may be described in terms of a large litter of healthy pigs farrowed at an early age in the life of the gilt.

The overall cost of production will be reduced if we can achieve in the hog business two of the aims of modern industry, namely: (1) rapid turnover and (2) mass production. Not many farmers have reason to complain that their gilts produce so many pigs that they cannot all nurse at one time. On the other hand there are many litters consisting of such a small number of pigs that the probable margin of profit is greatly reduced if, in fact, it exists at all.

Swine breeding research indicates that the heritability of number of pigs farrowed is only about fifteen per cent. This leaves the major portion of the variability in litter size under the influence of various environmental factors —some of which we think we know how to control and some which we apparently do not.

The aim of this article is to evaluate the effects of certain environmental factors upon the following reproductive phenomena:

1) Attainment of puberty.
2) Number of eggs released.
3) Per cent of eggs fertilized.
4) Per cent of embryos surviving to full term.

How do we promote early attainment of puberty? Several studies indicate that liberal feeding of a good growing ration will provide the optimum nutritional regime. Gilts which have been severely limited in feed intake are likely to require a longer time to reach puberty, and there is some evidence to indicate that gilts can also be too fat for early attainment of puberty. It is believed that ample protein in the

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ration is especially important for proper growth and development. In one Texas study gilts receiving a source of animal protein were seventeen days younger at puberty than those getting only vegetable protein.

The season of the year during which the gilts are born may be an influential factor also. Studies at the Wisconsin Station indicated that gilts farrowed in early spring (February) and those farrowed in late spring (May) both tend to reach puberty in early November with the resulting average age at puberty for the late-spring group being much less than for the early group. A similar study at Texas A & M compared gilts farrowed during four seasons of the year—February, May, August and October. The gilts farrowed in May averaged 6½ months at puberty while the other groups were from 24 to 33 days older and averaged about 7½ months.

If one is inclined to follow the widely recommended procedure of breeding gilts at about eight months to farrow at about a year of age, it is evident that those gilts which reach puberty earlier will have been through more heat periods, i.e. they are of greater "sexual age" which may be of practical significance as will be pointed out later.

It has been observed that many litter-mate gilts reach puberty at similar ages. In one controlled study 54% of full sisters had their first heat period on the same day or within a five-day period and there were significant differences between litters in age at puberty. There is reason then to expect that some progress might be made by selection for earlier age at puberty.

After a gilt has reached puberty and is experiencing normal estrous cycles the next big step toward good reproductive performance is the ovulation of large numbers of eggs of good quality. Of course, the number of pigs farrowed can be no larger than the number of eggs ovulated, and several estimates made to date indicate that actually only about 60-65% of these eggs are represented by normal pigs at farrowing time.

The number of eggs produced seems to vary directly as the level of feeding, and it appears that only a short period (two weeks or more) of full feeding a thin gilt is sufficient to increase ovulation rates by one to two eggs. It has also been observed that the number of eggs released at the second heat period is about one to two eggs more than are released at first heat period. Although data beyond the second heat period are meager, there is reason to believe that there is a potential advantage of from one to three pigs gained by wait-

ing until third or fourth heat period for mating a gilt as compared with breeding her at first heat.

This emphasizes the importance of having a gilt reach puberty early so that she can be in her third or fourth period at mating time about eight months of age. It should be pointed out that any advantage of greater "sexual age" at mating time may be overcome by allowing gilts to become over-fat.

It has been observed that large type sows usually farrow larger litters than small type sows, and one recent experiment at the Texas Station indicated a significant tendency for the longer bodied gilts within a breed to ovulate more eggs. This indicates that, in addition to feeding for higher ovulation rates, one can hope to boost the number of eggs produced by selecting his longer-bodied gilts of acceptable type.

Fertilization of the eggs released usually runs very high—90% or more. So failure of fertilization is not believed to be a very important item in reduced reproductive efficiency.

Quality of the eggs released by the gilt was mentioned above. This is a very difficult item to evaluate, and probably the most pertinent evidence of variability in egg quality is based on the appearance of eggs under the microscope. Data are not conclusive but all indications point to the likelihood that some eggs, though fertilized, do not continue to develop because of lack of viability of the egg. These fertilized eggs fragment early in pregnancy. In fact, some eggs are probably not even capable of being fertilized.

In one study where gilts bred at first heat were compared with gilts bred at third and fifth heats, it was found that only 80% of the first heat eggs were fertilized as compared to practically 100% of the two later periods. More of the fragmenting eggs were found among first heat eggs. These were considered to be unfertilized—but whether they were fertilized or not is a purely academic question since it is quite unlikely that such an egg would ever grow into a normal pig.

After the egg has been fertilized there is only about one chance in three, according to present estimates, of its surviving long enough to become a normal pig. For about three weeks after fertilization the embryo is nourished by "uterine milk" the fluid inside the uterus. This is a very critical period in the life of the embryo and most embryonic deaths seem to occur during this period. The nutritive value of "uterine milk" is quite likely influenced by the protein, mineral, and vitamin content of the ration of the gilt, and this in

turn probably has a great deal to do with the number of embryos that live through this period.

In one group of forty Hampshire gilts studied at the Texas Station those receiving 20% protein ration had an average of 8.6 embryos at 25 days of gestation while those receiving only 14% protein had an average of only 6.7 embryos. A similar study at the Animal Research Station at Beltsville, Maryland, indicates a similar advantage of high protein gestation rations on numbers of pigs raised. First week mortality of baby pigs was 30% in the low protein group and only 15% in the high protein group.

One factor which has a strong detrimental influence on embryonic survival is allowing gilts to become overfat. In several studies, full fed gilts have had a much lower percentage of eggs represented by normal embryos at 25 days (or normal pigs at birth) than similar gilts which have been hand-fed a limited amount of feed to control their gains. The physiological cause of this effect is still obscure, but the end result in small litters has been observed too many times to allow further neglect on this point. So it looks as though the hog farmer must control fatness.

Studies of the effects of antibiotics on reproductive performance have generally not given much promise of reducing embryonic mortality. One study did show an increase in embryo survival of thirteen percentage points (68%-81%) for gilts receiving an antibiotic.

Several studies indicate that waiting beyond the first few heat periods to breed a gilt will tend to reduce embryonic mortality. Perhaps "egg quality" improves a bit with succeeding crops of eggs released. In one study involving 40 gilts those gilts which had been through an average of 3.4 heat periods at mating time had 9.4 embryos at 25 days while those that had been through only 2.4 heat periods had an average of only 4.2 embryos. Part of the difference was due to a smaller number of eggs, part to a lowered fertilization rate and part to a higher embryonic death rate in the sexually younger group.

For maximum reproductive performance in gilts it appears that the hog man should guard against overfatness both before breeding and during gestation, but allow sufficient amounts of a high protein ration to insure good growth. He should also be sure that his gilts have been cycling and are in about the third or fourth heat period to take advantage of the effects of greater "sexual age" in higher ovulation rates and higher embryo survival rates.

Antibiotics for Dairy Calves

Careful research gives a fair evaluation of the new antibiotics . . .

Condensed from

Ohio Farm and Home Research

J. W. Hibbs *H. R. Conrad*
W. D. Pounden

THE widespread use of antibiotics in animal feeds today is a good example of the rapidity with which feed manufacturers and livestock men are putting into practice the results of research.

Aureomycin has been used more extensively than the other antibiotics in calf experiments, although some work has been done involving the use of terramycin, streptomycin, bacitracin and penicillin.

There is general agreement that the feeding of from 10 to 100 mg. of aureomycin daily to calves 3 to 116 days of age will produce an increase in growth of from 10 to 40 per cent over the untreated controls. However, considerable variation exists in the response obtained by various workers. Much of the apparent confusion that now exists stems from the fact that animal scientists do not know exactly what causes antibiotics to produce the growth response. It is encouraging, however, that the effects of certain factors on the growth response are helping to "pin point" the areas in which the mode(s) of action will be found.

Much of the available evidence indicates that the growth response is brought about through the action of the antibiotics on the intestinal microorganisms. This helps explain the failure to obtain a response when animals were reared in a sanitary or sterile environment. The effect could be exerted in several ways: 1) by depressing the growth of intestinal organisms that compete with the host for various nutrients; 2) by eliminating known pathogens (disease-causing organisms); 3) by eliminating bacteria which produce toxins that interfere with growth; 4) by encouraging the growth of organisms that synthesize known or

Reprinted from Ohio Farm and Home Research, Wooster, Ohio

unidentified nutrients. Thus it is difficult to distinguish between the therapeutic effects and the nutrient effects in the growth response.

The increase in body size from feeding antibiotics has been found to be largely due to increased body fat and to a lesser extent to increased muscle and skeletal growth. It is accompanied by an increase in feed consumption and an increase in feed efficiency. The degree of response appears to be influenced by certain dietary factors, the degree of exposure to infectious diseases, the level of antibiotic fed, and the age of the calves. The response is greatest in the first three to four months.

The results of an experiment conducted at Wooster, Ohio, in which aureomycin was fed to cud-inoculated calves fed various ratios of hay to grain will serve to illustrate the type of response which can result from aureomycin feeding. Three ratios of mixed hay to a simple grain concentrate mixture (4:1, 3:2, 2:3) were fed to calves 12 weeks of age. Twenty-four Jersey calves were included in this study. Aureomycin in the form of Aurofac 2A was fed in the milk at the rate of 15 mg. per day for the first 7 weeks during milk feeding and at the rate of 20 mg. per pound of dry feed ingested from the end of the seventh week to 12 weeks of age. From 12 weeks to 26 weeks the calves were fed either a 4:1 or 2:1 ratio of hay to grain.

Aureomycin increased growth in body weight and withers height, also stepped up feed intake and efficiency of feed utilization at all three hay to grain ratios. After 12 weeks, when the calves no longer were fed aureomycin, growth rate and efficiency of feed use dropped below the level of the controls so that no prolonged growth benefit resulted at either hay to grain ratio fed, 2:1 or 4:1. The percentage of dry matter, cellulose, and protein digested was not influenced by aureomycin feeding.

Less riboflavin was found in both rumen juice and urine when aureomycin was fed. Thiamine was not affected by aureomycin in either rumen juice or urine.

During the period from 8 to 12 weeks, blood sugar was maintained at a higher level in the aureomycin-fed groups than in the control group.

The finding that digestion of dry matter, cellulose, and protein was unaffected by aureomycin feeding shows that the increased growth resulted from some cause other than increased digestibility of the feed. The results of this experiment suggest that the primary cause, though involving the microflora of the rumen and lower digestive tract,

may be closely associated with energy utilization and metabolism. This is especially indicated by the higher level of blood sugar, and the shift observed in the relative proportion of propionic and butyric acids in the rumen juice.

Studies of Michigan dairy farms revealed costs can be reduced as much as $55 a cow (or 46 cents per 100 pounds of milk), when excellent, rather than poor-quality, hay and pasture are fed.

In conclusion it appears that under most conditions an increase in growth in calves will result from feeding aureomycin, terramycin and possible other antibiotics up to about six months of age. The response becomes less as the calves increase in age. The economic value of these increases in body size would depend upon whether or not the extra weight is to be marketed during this period and whether the extra gains would more than pay for the antibiotic used. In the case of herd replacements there is no particular advantage to be gained from the increased body weight since the differences in size do not persist until the age of first calving.

Thus, the principle advantage in feeding antibiotics to herd replacements would result from the control of certain calfhood diseases, especially those involved in diarrhea and respiratory infections. The ultimate value of the use of antibiotics in the feeding of calves and other animals must await the results of further research.

Power Failures and Your Home Freezer

Brief power failures caused by winter storms needn't bring worries about food keeping in a home freezer. Mary Beth Minden, Oregon State college extension home management specialist, said food will keep easily in a closed freezer if it is without electricity only for a few hours.

With the freezer closed, food usually will stay frozen in a fully loaded cabinet two days, she said. In a cabinet with less than half a load, it will not keep frozen more than a day.

During a power cut-off, the only three reasons for opening the freezer are to put in dry ice, to remove frozen food to a locker plant, or to take out food needed in an emergency. Opening the freezer to see if food is getting soft will only speed its thawing, she cautioned.

Chester Whites Gross $12,000 A Year

This Iowa farmer and his son have developed a successful hog enterprise . . .

Condensed from Breeder's Gazette

Wayne T. Messerly

HOW much land does it take to gross $12,000 a year? M. J. and Tilford Teig, father-and-son team from Hamilton, Co., Ia., are doing it with just 40 acres of their own land, plus a rented 160 acres.

If that sounds like a lot of income from only 200 acres, even in Iowa, you're right, because the Teigs make their money on hogs, not grain.

"Teig & Son of Stanhope, producers of purebred Chester Whites," is a familiar term among swinemen in central Iowa. It's not as big an operation as some, but it's proven to be a sound money-maker for the past 30 years.

Tilford is one of four brothers and went into partnership with his father in 1945. The father-and-son team share all profits and expenses on the farm 50-50.

Now that the elder Teig is 68 years old, most of the actual husbandry falls upon Tilford. He is a good hogman in his own right, but still relies on the know-how in swine management that his father has picked up in a lifetime of experience.

Hub of the Teig hog-raising setup is a 36 ft. x 54 ft. converted horse barn. The barn is used for pen farrowing although Tilford plans to try some farrowing stalls this year.

The interior of the big barn has been stripped of horse mangers and cow stanchions so that it provides an indoor shed for the hogs as well as a farrowing center. The barn is surrounded on two sides by 1,600 feet of concrete floor which can be divided into as many smaller lots as are needed. In one of these yards is a pole-type barn which is used for 25 beef cattle. Also provides some shelter for hogs.

Recently, the Teigs installed an automatic hog watering sys-

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tem in the concrete lots, so the hogs have their own separate waterers. These automatic waterers and self-feeders eliminate a lot of work. So do the concrete floors, which are scraped with a manure blade and scoop once a week. Another recent improvement is a handy loading chute with ample sorting gates.

The Teigs figure on selling about 80 breeding gilts and 35 breeding boars plus about 200 feeder pigs a year. Consequently, they have four different feeding programs: (1) for the pregnant sows; (2) for the nursing sows; (3) for the breeding stock; (4) for the feeders.

Sows with pigs are self-fed a ration of corn, oats, ground alfalfa meal and 35% protein. The nursing sows get less corn, but more oats, and alfalfa, plus some bran. The gilts kept for breeding are sorted out at 150 pounds. Then they are put on the ration for sows with pigs.

Breeding boars are sorted out at 80 to 100 pounds and get limited feeding to keep them in trim.

The hogs weeded out for market get all the corn they can eat plus a high protein supplement to get them off to market at 6 months.

The market pigs are confined to the concrete lots so they can be "pushed" faster, but the breeding stock have the run of rotation alfalfa-pasture in addition to concrete feeding floors. Use of the concrete and rotation pastures have proved very successful in eliminating disease.

"We vaccinate at 10 weeks for cholera," Tilford told me. "The male pigs which don't meet our standards are castrated at 80 to 100 pounds when we sort out the breeding boars. We wean at 8 weeks.

"We use pens with corner heat lamps for farrowing," he continued. "We have had good results with this method, but believe that farrowing stalls will be even better. Our average farrowing is 10 pigs per litter; we save from 7½ to 8 pigs per litter. We'll try a few farrowing stalls this year, and if they cut death losses we'll switch to them entirely," Tilford said.

To maintain bloodlines, the Teigs buy at least two young boars or outstanding sows a year from other purebred herds. Their present boars are out of herds of A. L. Bidne of Lake Mills and Seth Johnson, Kiron, Ia. Sows are pen bred and ear tagged with numbers. All pigs are ear-notched at farrowing and records are kept in the regular Association books from Rochester, Ind.

The Teigs market most of their hogs locally. Their buyers are usually farmers who want good sows or good boars to build up grade herds. The gilts are sold

during the February market while boars are slated for fall marketing.

Besides the home place of 40 acres, the Teigs rent 160 acres. They get good crop yields, but even so they have to buy about 1,000 bushels of corn and oats a year. They have always been able to rent land, but if the time came when they couldn't, what then?

"I think I'd stay in the hog business," Tilford ventured, "but I'd increase the output of both hogs and cattle and buy more grain than we do now. That way, I think I could make a go of it. At present, the partnership aims at grossing about $12,000 a year in hogs, which gives you a comfortable living after you take out expenses and income tax. And as long as you're doing the thing you like to do and making a comfortable living, I guess that's about all you can expect."

Grain Supplements Speed Finishing of Suckling Calves

When beef cattle are raised under intensified farming conditions and pasture is rather limited, the practice of feeding a grain mixture to calves while they are still running with their dams on pasture is meeting with considerable favor.

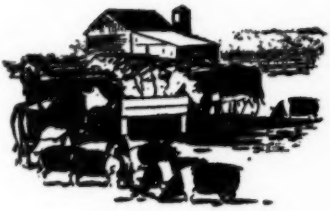
Dr. E. F. Waller, University of Delaware, says the finishing of calves by this system means a quick turnover, and can be recommended where grade herds are maintained for beef production in farming areas.

If spring calves are fed a supplement of grain on grass while they are nursing their dams, they can be marketed in the fall when weaned at an average weight of about 500 pounds, according to Waller. Beef calves 6 to 8 months old, of good quality and finish, are usually in good demand and generally bring greater net returns than if carried over another year or two.

Calves fed a grain supplement on grass while nursing may either be allowed to run with their dams and have access to grain in a self-feeder placed within a creep, or they may be given separate pasture with access to grain and be permitted to nurse 2 or 3 times a day. Using separate pasture for cows and calves involves more labor than allowing the calves to run with their dams.

Delaware Extension

Are You Satisfied With Your Income?



To make sure their farms are earning the greatest possible profit, 60 Kansas farmers used a new yard-stick on their operations. Here is what several discovered . . .

Condensed from Kansas Farmer

Dick Mann

HAVE you ever asked yourself: "Could I make more money with some other livestock or project or some other cropping system?"

You can find out by taking a few hours to compare on paper what you are doing now with what you could do. This is made possible thru a new short-cut method of comparing different crop and livestock combinations. This short-cut has been worked out by 7 Kansas State College Extension economists. They call this new comparison method "The Block System," and all the information you need to apply it to your farm is contained in a bulletin titled "More Money from Your Farm," now available from Kansas State College, Manhattan, Kansas.

The bulletin contains sets of tables in which you can put figures on what you are doing now and, on the same page, figures for some alternate system of your choice. The economists have worked out the answers for all livestock systems and cropping systems with price differentials on cost of crop production for various areas in the state.

You will find in the bulletin such information as native grass requirements for every class of livestock, average income over cost per unit you can expect, number of head necessary for $1,000 income over costs, average per acre cost of growing and harvesting various crops, per acre cost and labor requirement of selected rotations, the feed, labor, capital requirements, and average annual investment per unit in livestock enterprises, and how to convert grass used as pasture into tons of hay equivalent.

When you get thru working out an alternate system, the book will have a sheet that will give you a summary of labor requirements, income, capital required and undistributed income. It even has

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a family block to summarize distribution you make of your available cash income. This table shows you how to measure your total cash available against your fixed obligations and family living expenses.

Several tables are included in the bulletin showing standards used in estimating capital requirements, feed requirements, cropping costs, prices of products. Figures for average costs and profits have been taken from actual records of Kansas farms.

More than 60 farmers in Brown county have applied this new yardstick to their farming operations with satisfactory results, says Frank Overley, Brown county Balanced Farming agent.

With Mr. Overley we recently called on farmers to see what they found out, and what they thought of the Block System of measurement.

Robert Bruning is farming 230 acres with corn as the major crop.

He tried deferred-feeding of steer calves but found it did not work for his farm. Then he went on a Winter full-feeding program. Applying the Block System to his farm brought him what he believes will be the answer. "I need a livestock program," he says, "that will make use of Spring and Fall pasture, roughage and corn. It looks like my best plan would be to go on a system of wintering plain cattle, then selling them off before hot weather takes the pasture. Also, I can profit by increasing my hog program."

A. L. Winter, who rents 35 acres, found on applying the Block System test that he is making maximum returns on his cropping program of corn, wheat and oats, plus a program of wintering over-400-pound calves. " I buy these calves in September and sell them off grass the following August," he says. He carries 50 head of calves. By selling on about August 1 he avoids running out of pasture in dry years and gives his pasture some rest before the next calves arrive. Just knowing you are making the most of what you have is reassuring, thinks Mr. Winter. He knows now that to increase his income his only recourse is more land. He has rented another quarter for 1956.

Could Increase Profit $5,000

Probably the most startling revelation came to Eddie Finger. He took one of the Block Testing bulletins and made the astounding discovery that without increasing his farm size one acre he could increase his profit about $5,000 a year. Here is his story:

"I have a herd of 40 Angus cows and produce stocker calves," he says. "For some time I had been wanting to make a change but I didn't know which way to turn until I applied this Block System.

"Under my present plan I had too many classes of livestock to take care of them properly. There are other problems, too. My cow herd is in partnership with my father, Chris Finger, Sr. There isn't enough volume to make any money. We have to have more lots. I have had five different lots of cattle on hand, each lot requiring different management. I have had this situation: One lot of cows and calves, two lots of yearlings, two lots of cattle held over on feed.

"Then, too, Dad and I, altho going 50-50, didn't always have an equal number of calves. My present pasture was just enough for the 40 cows so I had to rent pasture for the calves." A secondary project is 12 sows farrowing twice a year.

When he got everything down on paper under the Block System method, Mr. Finger found by making a few changes in his cropping management and switching his livestock program to 120 head of deferred steers and 20 sows farrowing twice a year, he could increase his labor and management income on 400 acres from the present $2,508 to a probable $7,749.

How will he make the changeover, which he plans to start this year?

"My first big problem is the job of renovating the present bluegrass pasture," says Mr. Finger. "It has needed renovating for several years but the job was impossible so long as it had to support the cow herd.

"I already have made some pasture improvement in that I have sprayed with 2-4,5,T the trees that were robbing me of some grass. This treatment has been 100 per cent effective.

"The bluegrass pasture will be renovated by seeding a good mixture of grass and then fertilizing. During the year I must wait for this pasture to grow I will winter some heifer calves, selling them off before time to go to grass.

Cattle feeding continuously on a pasture can trample a lot of good grazing into the ground. Grazing efficiency studies show that often only 50 per cent of the grazing produced is eaten by livestock. Rotation grazing will help correct this situation.

"Part of the increased income will be due to the renovated pasture. Part of it will come from expected increased crop returns thru better farming, plus some minor shifts in acreage.

"For instance, I'm now raising 50 acres of corn yielding 40 bushels an acre an the average. I will increase this to 65 acres and shoot for a minimum of 60 bushels an acre thru use of com-

mercial fertilizers. My present wheat acreage of 25 acres will have to remain the same.

"My oats acreage will be increased by 5 acres and I will drop my present 17 acres of corn silage and substitute 15 acres of atlas sorgo to get greater tonnage per acre."

Under his old program, Mr. Finger and hired help were putting in 151 10-hour days of labor on crops and 372 on livestock for a total of 523 days. The new program will boost his labor to 166.5 days on crops and 404 on livestock for a total of 570.5 days.

By adding 18 acres of present pasture to his cultivated acreage and use of fertilizer, cropping costs will be increased from the present $3,140 on 157 acres to $4,525 on 175 acres, but income from crops will be increased from $4,905 to expected future $7,336.

An Increase in Investment

On the livestock projects a summary of costs shows there will be an increase in capital investment in livestock from the present $19,000 to future $25,000. Income over costs will be changed from present $4,440 to expected future $7,960.

Other changes will be an increased hired labor cost from present $1,575 to future $1,925, an increase in interest on working capital at 6 per cent from present $1,362 to future $1,722.

It is interesting to note no increased investment will be needed for machinery, buildings, land or improvements, and that all of the expected increase in net income will be due to management.

This story proves that all farmers interviewed learned something of value, even tho only 1 out of four was spectacular.

Urea A Good Buy

Urea for use as dairy feed is turning out to be a good buy for many farmers, reports George Werner, dairy specialist at the University of Wisconsin. But—he warns it is very potent and can be dangerous to livestock if it isn't used carefully.

Never use more than 3 pounds of urea in each 100 pounds of farm grains, Werner advises. Most important thing to remember is to make sure the urea is very well mixed in with the grain so there's no chance one cow can get a large dose. It isn't easy to make sure that three pounds of urea is spread evenly through 100 pounds of feed, but it has to be done.

Werner says urea is a good buy whenever a pound of urea and seven pounds of ground corn cost less than seven pounds of oil meal.

Wisconsin Extension

Rain is Slim but Cattle are Fat

The story of the quick response by grass and beef to the management genius of a young conservation rancher . . .

Condensed from Soil Conservation

Chester F. Fry, Soil Conservation Service

INCREASING beef production 5,440 pounds per year while at the same time reducing his cow herd from 168 to 100 animals is the significant achievement of young Bob Sprowls, conservation rancher, who operates a spread near Elk City, Okla. Sprowls took over the management of the ranch after graduation from Oklahoma Agricultural and Mechanical College in 1951.

The ranch consisted of one pasture of 2,520 acres with 168 head of commercial beef cows and about 50 head of yearlings. The yearlings were sold in the fall of '51. The next year Bob raised 73 calves, most of them dropped in the summer. He sold them at an average weight of 400 pounds—a total of 28,600 pounds.

Young Sprowls was not satisfied with either the rate of production or the condition of his grass. He discussed his situation with Fred Whittington, a range conservationist at Elk City, and worked out a conservation plan. It was important to balance the livestock number with the available grass, and leave enough growth on the grass to build up the range—as Fred put it, simply "take half and leave half."

Bob started his new program by culling his herd and selling 48 head of cows. Then he seeded 100 acres of formerly cultivated land to native grass. One big pasture was cross-fenced into three smaller pastures to make better management possible. One pasture was rested through the growing season for winter use, and 350 tons of silage were put up from the cultivated land. He penned his bulls to regulate calving dates.

Results came the very first year. Young Sprowls sold 2,600 more pounds of beef than the year before. The calf crop increased from 44 per cent to 65 per cent. The average per cow

Reprinted from Soil Conservation, Washington, D. C.

was 260 pounds, as against 170 in 1952. This was done with the same amount of hay plus 170 tons of silage. At the same time, he reduced the protein supplement from 25 tons to 3 tons.

After this experience, Bob sold 20 more cows, leaving a herd of 100. In 1954 he sold 34,040 pounds of calves. He produced an 80 per cent calf crop, with an average of 340 pounds per cow. Profits have gone up even more than production. Feed bills are down, and so are operating expenses, interest, and taxes.

The grass? Fred Whittington reports a very definite improvement in spite of drought conditions. Rain gages near the ranch recorded 13.32 inches of rain in 1952, 16.8 inches in 1953, and 20.09 inches in 1954. This is in contrast with an average of nearly 22 inches per year.

Conservation ranching is paying off for Bob Sprowls, but the benefits don't stop there. He is doing his part in the land treatment program carried on by his Upper Washita Soil Conservation District. This is a very important part of the upstream flood control program being established on the Washita River watershed. The biggest reservoirs are in the soil itself.

Conservation ranching keeps the soil in condition to absorb large quantities of water, thereby helping to reduce floods. To illustrate, tests were made near Ardmore, Okla., in August 1951. A fence-line contract on a typical prairie upland range site was selected. One side of the fence was well managed, moderately grazed range in excellent condition.

The other side of the fence was overgrazed range in poor condition, a pasture rented out a year at a time with no grazing restrictions. A concentric ring infiltrometer was used to determine the infiltration rates on the two conditions. In a 2-hour test, the excellent condition range took up 10 inches of water compared with 4 inches on the poor condition range.

After the first 15-minute period, the excellent range continued to take up one or more inches of water each 15 minutes while the poor range gradually took water at a slower rate, finally dropping to only one-fourth the rate of other's intake. Under natural rainfall, there would have been yet more contrast as the force of raindrops would churn the soil and seal the surface on the poor range.

Thermometers were used to measure the effect of range cover on soil temperature. The test was made under a cloudless sky with the air temperature at 105° F. The soil temperature was 95° F, under a cover of ex-

cellent condition and 135° F under poor condition. There would be very little, if any, activity of beneficial soil organisms at the higher temperature and the evaporation would be much higher.

Clippings were made to measure the amount of ground cover. The excellent range had 5,500 pounds per acre of standing forage, including some from the previous year's growth. There were 2,000 pounds per acre of mulch or litter on the soil surface, making a total of 7,500 pounds per acre of protective cover. The poor range had 1,750 pounds per acre of vegetation, but no measurable amount of mulch or litter.

Surplus Dairy Products Disappearing Says USDA

The U. S. Department of Agriculture reports the surplus of dairy products has been whittled down, and it looks like it will be reduced even more this year. That is, if total milk production holds down and demand continues strong.

Government buying has decreased. More milk and dairy products are going direct to consumers. The milk equivalent of dairy products purchased by the Department of Agriculture amounted to nearly 6 billion pounds in the marketing year ended March 31, 1955 compared with 11 billion pounds a year earlier.

Unsold dairy products owned by CCC in mid-March 1955 were equivalent to about 8.5 billion pounds of milk compared with nearly 13 billions on July 1, 1954.

The Department of Agriculture credits the following as being responsible for this more favorable situation:

1. The reduction in retail prices for dairy products in 1954 helped increase consumption.
2. Increased advertising and special promotions by the Dairy Industry itself, is stimulating greater consumption.
3. More children are drinking more milk at school due to the special school milk program.
4. More milk and dairy products are provided military personnel, both on regular establishments and in hospitals.
5. The needy are receiving greater donations of dairy products.

Farm, Ranch & Home News

HOW A GRAIN DRIER PAYS

One farmer's experience with an electric fan for drying grain and hay . . .

Condensed from The Southern Planter

J. L. Calhoun, Virginia Polytechnic Institute

DOES it pay to dry and store small grain on the farm? It does according to J. A. Clapp of Virginia, and he has figures to prove it. These records show that it meant $290 more farm income last season.

Clapp figured a drier would help reduce losses at harvest time. Then, too, he felt by drying and storing on the farm, wheat would bring a higher price. He also reasoned that hauling costs would be less after the rush of marketing the new crop was over. Clapp installed a dried in time to handle the 1954 crop.

Paid Him 65 Cents a Bushel

Clapp dried 450 bushels of wheat and stored it on the farm under the government loan program. "If I hadn't had the drier, I would have taken $1.65 per bushel for my wheat less 15 cents per bushel for having it hauled," he said. This wheat was delivered to the Commodity Credit Corporation in Richmond during the period March 8-11, 1955 at a price of $2.25 per bushel less 10 cents per bushel for hauling costs. The net price at harvest time would have been $1.50 per bushel as compared to $2.15 per bushel by holding the wheat until March.

By drying and storing on the farm Clapp received a premium of 65 cents per bushel for his wheat. He pointed out that when the wheat was delivered, it would have sold for $2.20 per bushel on the Richmond market. So drying and storage on the farm would have paid off in either case.

Clapp figures the drier more than paid for itself the first year. His cash expense for putting in the drier was about $150. The fan cost $99, belts and pulleys $10 and hardware cloth and screen wire $40. An electric motor of the proper size and the lumber needed were already on hand.

The drier was installed in a small granary 14 feet by 20 feet in size. A main air duct extends

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along one of the inside walls. The drying floor is about 10½ by 16 feet and is made in sections using 2x4 lumber, hardware cloth and screen wire. The 2x4 pieces are about 8 inches apart. The hardware cloth is stapled to the 2x4 lumber and is covered with screen wire. The hardware cloth gives strength to the drying floor and the small openings in the screen wire will not allow grain to pass through it. On the other hand, it provides for free movement of air into the grain for drying.

> In spite of price drops, farmers cash receipts from milk have increased 3½ times since 1940.

The sections of this floor rest on 2x8 joists 4 feet apart. A small enclosure in the corner of the building houses a 24-inch fan driven with a one horsepower electric motor. Outside air enters the fan through an air intake door in the building wall.

How It Works

Grain is placed on the drying floor. The air intake door is opened and the motor and fan are started. The fan forces air into the main air duct, under the drying floor, and up through the grain. This movement of air through the grain does the drying job. The drying floor also serves as a storage bin until the grain is marketed.

In explaining how the drier was used last season Clapp said, "I started harvesting about four or five days earlier than I would normally. The first wheat was dampest and I started the drier after a layer of grain was over the drying area. I'd cut the drier on about 10 o'clock in the morning and cut it off about sundown." After about 80 hours of fan operation the wheat was dry enough for storage. He found this quite different from an earlier experience. "The first year I had a combine," he said, "I lost 100 bushels of wheat because it was so wet and I had no way to dry it."

Operating Cost Is Low

Clapp figures the 80 hours of drier operation amounted to about ½ cent per bushel for electricity. In addition, he spent about $4 for materials to fumigate the grain while in storage. He also paid $2 for rat poison.

Clapp expects to use the motor and fan for another purpose. It will be moved to the crib to dry ear corn this fall. A crib can be prepared for drying ear corn at little cost. The drier will enable him to harvest corn several weeks earlier than usual. By harvesting early, Clapp believes field losses will be reduced and that the picker will do a better job. It also paves the way for seeding small grain early.

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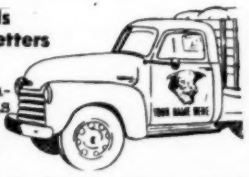

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Must Farm Bookkeeping Be So Difficult?

There's no doubt about it! Keeping farm records the way everyone — including the tax collector — says you should is anything but a pleasant chore.

To begin with, farmers just don't like bookkeeping and know little about it. It's the kind of job you like to put off until just the right day and mood — or until the very last minute.

Yet, no matter how difficult and unpleasant, it is mighty important that you keep complete and accurate farm financial records. Without them, you can't do a good job of planning and managing. You can't know which projects turn a profit and which actually lose money for you.

Taxes are another reason why you should keep records of expenses and income. In fact, you can't afford not to report all your farm expenses as deductions from your income. It's just like throwing money away. Expenses not reported through oversight or denied because they are unsupported, cost farmers an average of 22c on the dollar. If you are in a higher bracket, they cost much more. One farm family figured their accounting paid $25 an hour.

There's one main reason why farmers don't make good book keepers: They don't have the time or inclination to do the job at the exact time when regular accounting methods require it to be done. You just can't be expected to drop everything, run home and make an entry every time you spend a dime or collect a dollar.

To overcome this universal objection to farm record systems now available, there's a promising new idea which lets you do your farm bookkeeping when you feel like it. To be introduced soon, it will consist of a special bank deposit book and a yearly summary or account book. To use this system, you deposit all your farm income in your bank using the new deposit book to record where the funds came from and what they paid you for. You pay all your bills and expenses by check noting on the stub or check what you are paying. So far as possible you try to avoid easy-to-forget cash purchases by setting up accounts at your favorite dealers who will bill you once a month.

By this method you make positive, undisputable records as you go along. At any convenient time, you sit down with your bank deposit book and check stubs and bring your account book up to date. If the idea sounds good and you want more information, drop a line to Farmer's Digest, Box 404, Fort Atkinson, Wisconsin. We will see that you get additional information.